

**UNDERGROUND INJECTION CONTROL  
PERMIT APPLICATION**

**Ute Tribal # 03-04  
360' FNL & 460' FWL  
Sec. 3, T5S-R3W  
Duchesne County, Utah  
API # 43-013-31736**

July 2015

Prepared for:  
Bruce Suchomel  
Groundwater Program, Mail Code 8P-W-UIC  
U.S. Environmental Protection Agency  
1595 Wynkoop St  
Denver, CO 80202-1129

Prepared by:  
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Boise, Idaho 83707  
(208) 685-7600  
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## **LIST OF ATTACHMENTS**

- Attachment No. 1      Area Topography Map
- Attachment No. 2      Site Map
- Attachment No. 3      Map of the A-Marker surface
- Attachment No. 4      Cross-Sections of the injection formation
- Attachment No. 5      Water Analysis
- Attachment No. 6      Completion data for all wells in the AOR
- Attachment No. 7      CBL for the UIC well
- Attachment No. 8      Open hole log for the UIC well
- Attachment No. 9      List of owners and Affidavit Notification
- Attachment No. 10      Well bore diagrams for the UIC well
- Attachment No. 11      P&A procedure
- Attachment No. 12      MIT procedure
- Attachment No. 13      Surety Bond letter

**SUMMARY DOCUMENT**  
**UIC WELL APPLICATION**  
**Ute Tribal 03-04**  
**API # 43-013-31736**

The following document contains information provided in support of the application for the conversion of the Ute Tribal 03-04 well to an injection well in the Green River formation in the Antelope Creek Field in Duchesne County, Utah.

The Antelope Creek Field falls within the Uintah and Ouray Indian reservations and is within Indian Country; therefore, for facilities located on the reservation, only EPA-issued UIC permits are necessary for compliance with UIC regulations.

The EPA has issued an Area Permit #UT20736-00000 for the Underground Injection Control for the Antelope Creek Field. This area permit allows for additional producing wells to be converted to injection wells for enhanced recovery.

- (1) Petroglyph Energy, Inc. (Petroglyph) is the operator and only working interest owner of wells located in the Antelope creek Field, Duchesne County, Utah. Petroglyph's business address is provided below:

Petroglyph Energy, Inc.  
960 Broadway Avenue, Suite 500  
P.O. Box 70019  
Boise, ID 83707

- (2) Enclosed as Attachment No. 1 is a topographic map of a portion of the Antelope Creek Field, identifying all wells located in this area. The legal location for the Ute Tribal 03-04 is 360' FNL & 460' FWL Lot 4 Sec. 3, T5S-R3W.
- (3) Attachment No. 2 is a map of the well. This map shows a circle with a ¼ mile radius centered on the Ute Tribal 03-04 well. The ¼ mile radius encompasses the area of review, AOR, within which Petroglyph is required to investigate all wells for mechanical integrity. The ¼ mile radius also identifies mineral ownership; those lands, and the the owners thereof, which must be provided notice of this application. The AOR has Ute Tribal 04-01A well(s) located in its ¼ mile radius.

- (4) Petroglyph proposes to utilize the Ute Tribal 03-04 as an injection well for enhanced recovery in the Antelope Creek Field.
- (5) Injection Zone – The injection intervals are between 4186' and 6194' True Vertical Depth and located in the lower portion of the Green River Formation. The injection zone is confined within a 2008' section between the Green River "A" Lime marker bed and the top of the Basal Carbonate in the lower part of the formation. The injection zone is composed of lenticular calcareous sandstones interbedded with low permeable carbonates and calcareous shales. The lenticular sandstones vary in thickness from 1 to 30 feet.

Confining Zone – The overall confining strata above the injection zone consists of impermeable Green River calcareous shales and continuous beds of microcrystalline dolostone. The confining zone in the Ute Tribal 03-04 is 250 feet thick.

Attachment No. 3 is a structure map of the A-Marker surface.

Attachment No. 4 is a cross-section of the injection interval and confining zone.

- (6) Enclosed as Attachment No. 5 are standard analyses of produced water from three batteries that currently serve as central handling facilities for all project producing wells. The analysis of the Green River formation water from the Ute Tribal 18-08 Satellite Battery is 12805 mg/L of total dissolved solids (TDS), Ute Tribal 21-11 Satellite Battery is 15659 mg/L TDS, and Ute Tribal 34-12-D3 Satellite Battery is 14590 mg/L TDS.

Injectate in the field is a mixture of produced water and fresh make-up water. The nearest injection well is the Ute Tribal 04-02, the most recent analysis of the water being injected into the Green River formation at this location is 6329 mg/L TDS. This analysis is also included in Attachment No. 5.

- (7) A summary of completion data from the Ute Tribal 03-04 and offset wells in the AOR are included in Attachment No. 6
- (8) The cement bond log is included in Attachment No. 7.
- (9) The open hole log for the Ute Tribal 03-04 is included in Attachment No. 8.

- (10) The Antelope Creek Field is operated under a Cooperative Plan of Development between the Ute Tribe and Petroglyph Energy. At the Ute Tribal 03-04 location, all mineral owners, surface owners and operators located within the AOR ¼ mile radius have been notified of the submitted EPA application to convert to injection. Attachment No. 9 is the Affidavit of Notification to all owners.
- (11) Petroglyph requests a maximum surface injection pressure of **1900psi**. The EPA Area Permit No. UT20736-00000 uses the formula:

$$P_m = (0.88\text{psi}/\text{ft} - 0.43\text{psi}/\text{ft}(S_g)) D$$

Where:

$P_m$  = Maximum surface injection pressure

0.88psi/ft = Fracture gradient

D = Top perforation depth

0.43psi/ft = Hydrostatic pressure/hydraulic head

$S_g$  = Specific gravity of injection fluid

For the Ute Tribal 03-04:

$$\mathbf{1927\text{psi} = (0.88\text{psi}/\text{ft} - 0.43(1.00)) 4282\text{ft}}$$

EPA Area Permit No. 20736-00000 further caps maximum surface pressure at 1900psi.

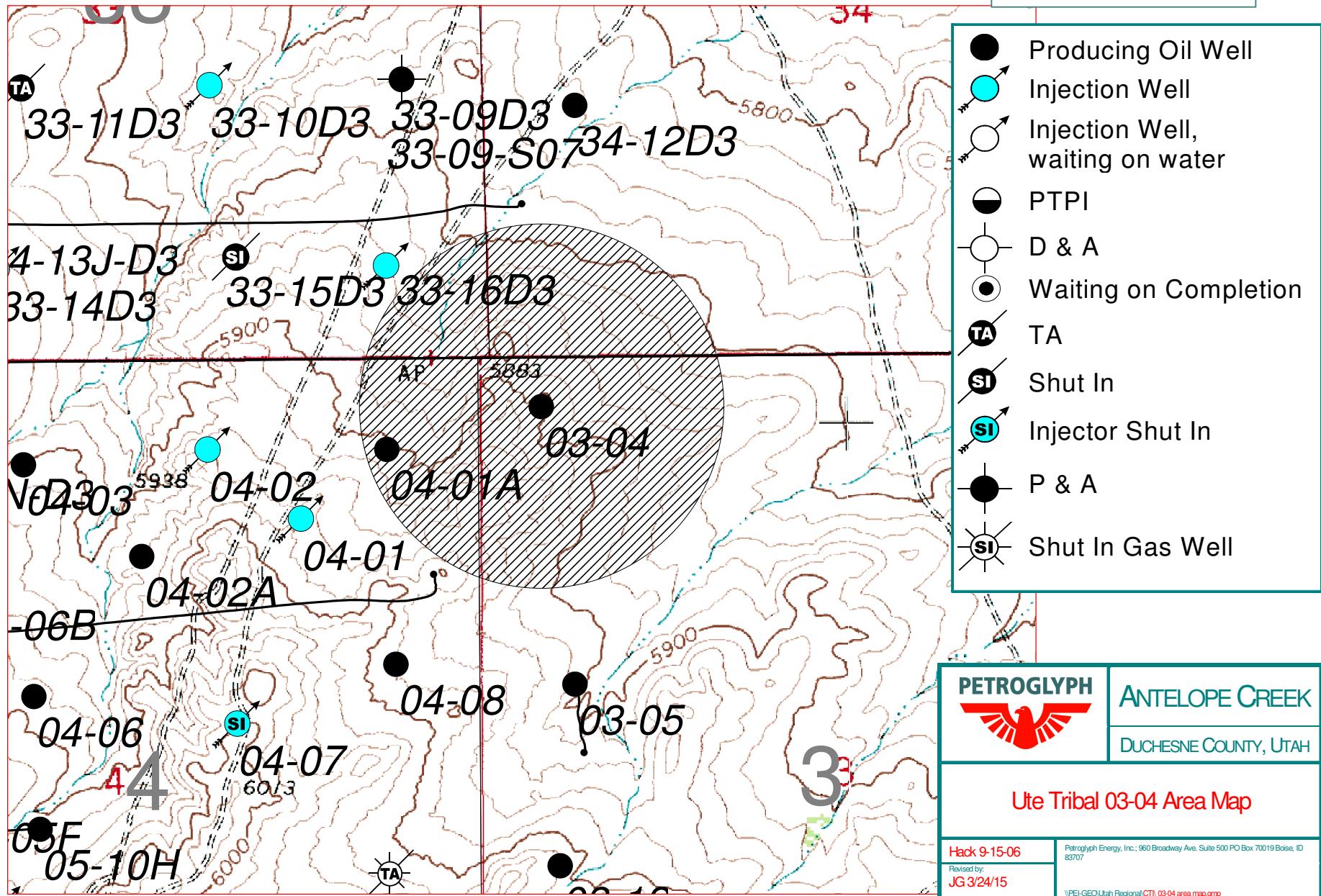
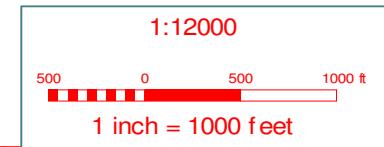
- (12) Three wellbore diagrams for the Ute Tribal 03-04 are in Attachment No. 10. One diagram is for production, one for injection, and one for Plug & Abandonment (P&A).
- (13) The P&A procedure for this well is shown in Attachment No. 11.
- (14) Once the draft permit is issued, Petroglyph will conduct a Mechanical Integrity Test and a static bottom-hole pressure test. The MIT procedure is contained in Attachment No. 12. The conversion work will be satisfactorily completed and submitted to the EPA on Form 7520-12. A wellbore schematic will be included with this form.

- (15) Petroglyph will give proof of financial responsibility by posting a surety bond for the UIC well prior to final permit approval. A copy of this letter is contained in Attachment No. 13.
- (16) Petroglyph will install various gauges on the well so that the injection pressure and tubing/casing annulus pressure can be monitored. The well will be equipped with a flow meter with a cumulative volume recorder.

ATTACHMENT NO. 1

AREA MAP

ATTACHMENT NO. 1:  
AREA MAP



ATTACHMENT NO. 2

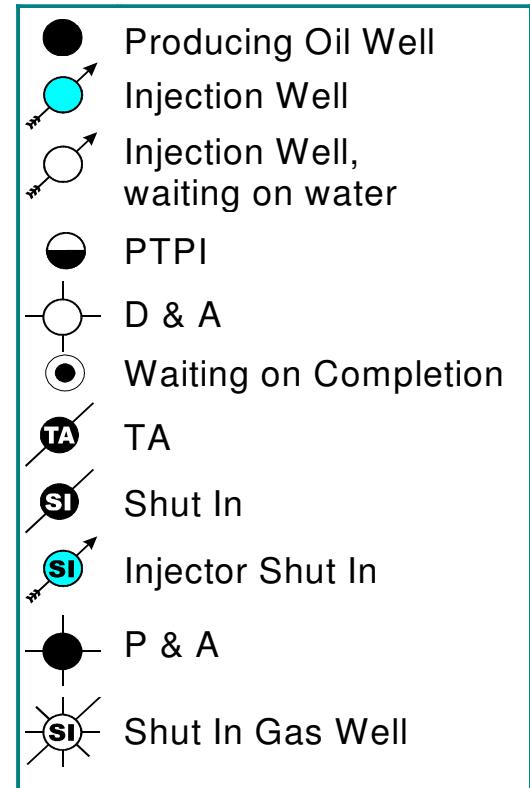
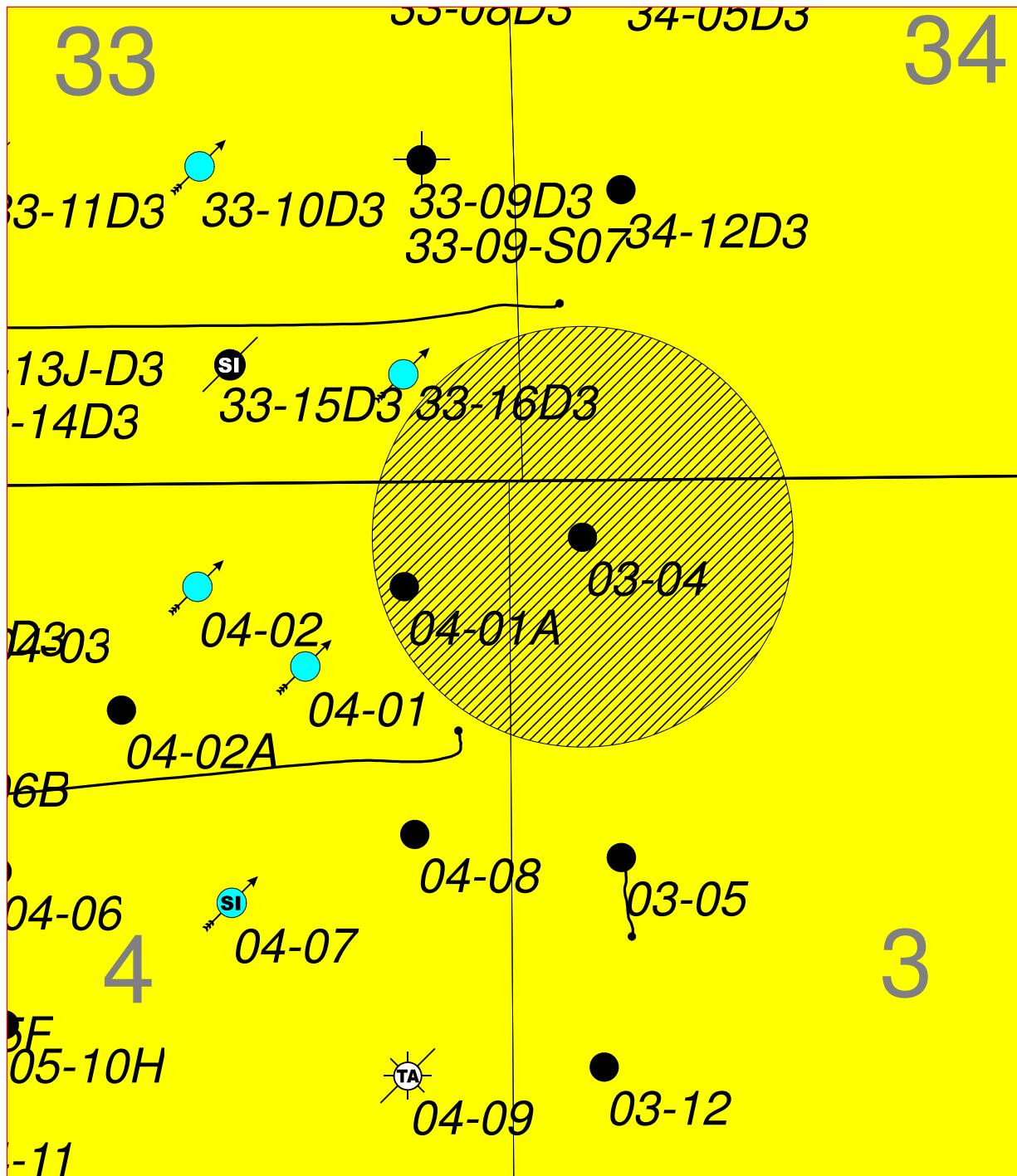
SITE MAP

RADIUS MAP OF ADJACENT WELLS

ATTACHMENT NO. 2:  
SITE MAP

1:12000

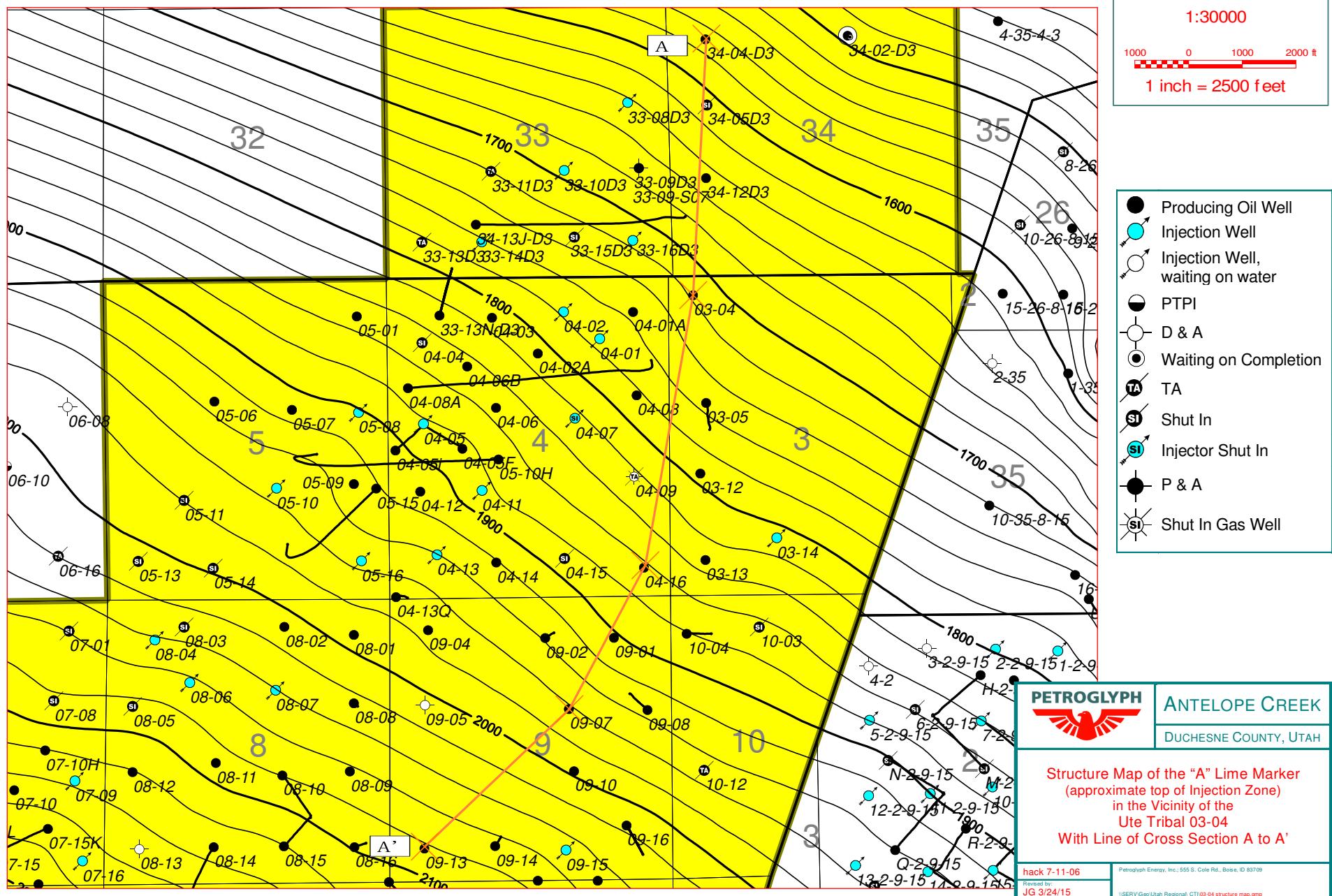
500 0 500 1000 ft  
1 inch = 1000 feet



**ATTACHMENT NO. 3**

**MAP OF THE A-LIME MARKER SURFACE**

ATTACHMENT NO. 3:  
Map of the "A" Lime Marker



**ATTACHMENT NO. 4**

**CROSS SECTIONS OF THE INJECTION FORMATION**

# Structural Cross Section A to A' in the Vicinity of Ute Tribal 03-04

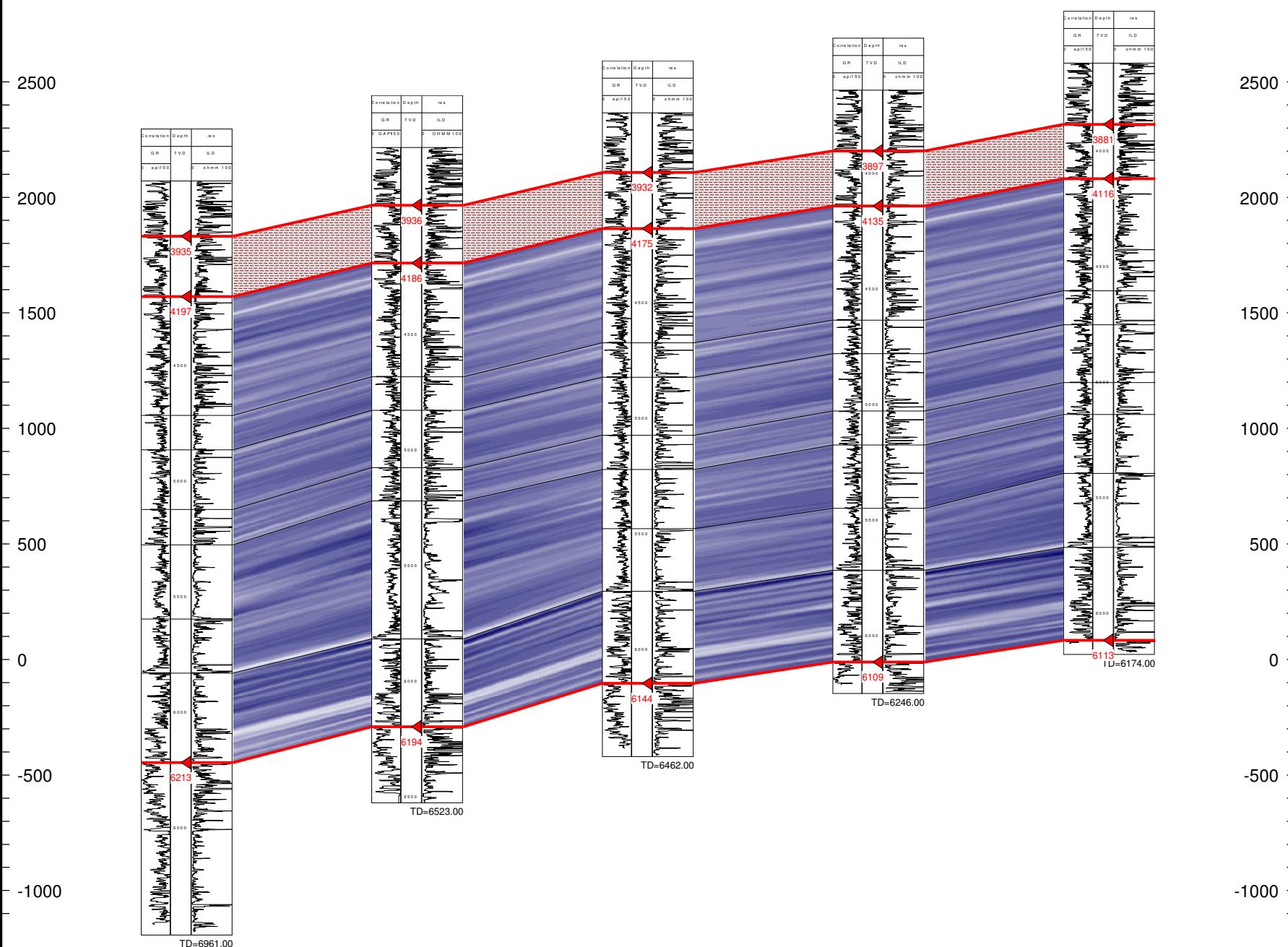
430135155400000  
 ● ←  
 PETROGLYPH OPERATING COMPANY  
 UTE TRIBAL 34-04-D3  
 660 FNL 762 FWL  
 TWP: 4 S - Range: 3 W - Sec. 34

4788 ft      430133173600000  
 → ● ←  
 PETROGLYPH OPERATING COMPANY INC  
 Ute Tribal 03-04  
 360 FNL/460 FWL  
 TWP: 5 S - Range: 3 W - Sec. 3

5116 ft      430135121300000  
 → ● ←  
 PETROGLYPH OPERATING COMPANY  
 UTE TRIBAL 04-16  
 589 FSL 480 FEL  
 TWP: 5 S - Range: 3 W - Sec. 4

3035 ft      430135152100000  
 → ● ←  
 PETROGLYPH OPERATING COMPANY  
 UTE TRIBAL 09-07  
 2087 FNL 1910 FEL  
 TWP: 5 S - Range: 3 W - Sec. 9

3722 ft      430135119900000  
 → ● ←  
 PETROGLYPH OPERATING COMPANY  
 UTE TRIBAL 09-13  
 650 FSL 657 FWL  
 TWP: 5 S - Range: 3 W - Sec. 9



**ATTACHMENT NO. 5**

**WATER ANALYSIS**

## Water Analysis Report

Production Company: PETROGLYPH OPERATING CO INC - EBUS  
 Well Name: UTE TRIBAL 18-08 SATELLITE, DUCHESN  
 Sample Point: PLANT DISCHARGE COMPLETE  
 Sample Date: 4/21/2015  
 Sample ID: WA-307075

Sales Rep: James Patry  
 Lab Tech: Gary Winegar

Scaling potential predicted using ScaleSoftPitzer from  
 Brine Chemistry Consortium (Rice University)

Sample Specifics	
Test Date:	4/21/2015
System Temperature 1 (°F):	60.00
System Pressure 1 (psig):	14.70
System Temperature 2 (°F):	180.00
System Pressure 2 (psig):	2000.00
Calculated Density (g/ml):	1.0061
pH:	8.50
Calculated TDS (mg/L):	12805.08
CO <sub>2</sub> in Gas (%):	
Dissolved CO <sub>2</sub> (mg/L):	0.00
H <sub>2</sub> S in Gas (%):	
H <sub>2</sub> S in Water (mg/L):	0.00

Analysis @ Properties in Sample Specifics			
Cations	mg/L	Anions	mg/L
Sodium (Na):	4541.75	Chloride (Cl):	6000.00
Potassium (K):	41.78	Sulfate (SO <sub>4</sub> ):	163.00
Magnesium (Mg):	28.63	Bicarbonate (HCO <sub>3</sub> ):	1952.00
Calcium (Ca):	67.44	Carbonate (CO <sub>3</sub> ):	
Strontium (Sr):	5.41	Acetic Acid (CH <sub>3</sub> COO):	
Barium (Ba):	0.90	Propionic Acid (C <sub>2</sub> H <sub>5</sub> COO):	
Iron (Fe):	2.74	Butanoic Acid (C <sub>3</sub> H <sub>7</sub> COO):	
Zinc (Zn):	1.29	Isobutyric Acid ((CH <sub>3</sub> ) <sub>2</sub> CHCOO):	
Lead (Pb):	0.05	Fluoride (F):	
Ammonia NH <sub>3</sub> :		Bromine (Br):	
Manganese (Mn):	0.09	Silica (SiO <sub>2</sub> ):	

## Notes:

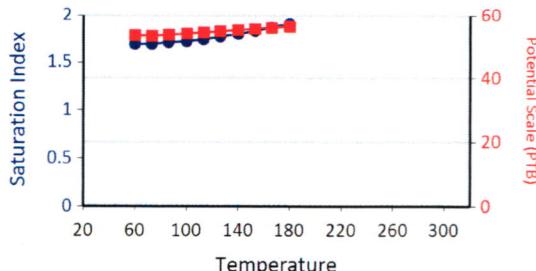
(PTB = Pounds per Thousand Barrels)

Temp (°F)	PSI	Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO <sub>4</sub> ·2H <sub>2</sub> O		Celestite SrSO <sub>4</sub>		Halite NaCl		Zinc Sulfide	
		SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	1.91	56.41	0.09	0.09	0.00	0.00	2.59	1.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
166	1779	1.87	56.05	0.13	0.14	0.00	0.00	2.54	1.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153	1558	1.83	55.66	0.19	0.19	0.00	0.00	2.49	1.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	1338	1.80	55.27	0.26	0.24	0.00	0.00	2.44	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
126	1117	1.77	54.86	0.33	0.29	0.00	0.00	2.38	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	897	1.74	54.46	0.42	0.33	0.00	0.00	2.32	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	676	1.72	54.08	0.52	0.38	0.00	0.00	2.26	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	455	1.71	53.72	0.64	0.41	0.00	0.00	2.20	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	235	1.69	53.39	0.77	0.45	0.00	0.00	2.14	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	14	1.69	53.56	0.92	0.47	0.00	0.00	2.08	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

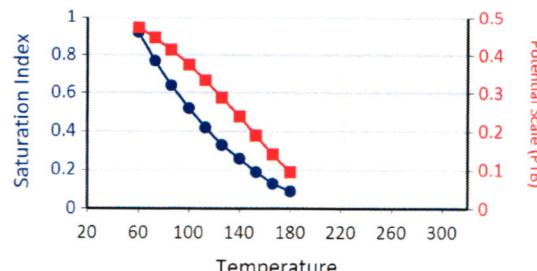
Temp (°F)	PSI	Hemihydrate CaSO <sub>4</sub> ·0.5H <sub>2</sub> O		Anhydrate CaSO <sub>4</sub>		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
		SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	0.00	0.00	0.00	0.00	0.00	0.00	2.20	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
166	1779	0.00	0.00	0.00	0.00	0.00	0.00	2.09	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153	1558	0.00	0.00	0.00	0.00	0.00	0.00	1.96	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	1338	0.00	0.00	0.00	0.00	0.00	0.00	1.83	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
126	1117	0.00	0.00	0.00	0.00	0.00	0.00	1.69	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	897	0.00	0.00	0.00	0.00	0.00	0.00	1.53	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	676	0.00	0.00	0.00	0.00	0.00	0.00	1.37	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	455	0.00	0.00	0.00	0.00	0.00	0.00	1.19	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	235	0.00	0.00	0.00	0.00	0.00	0.00	1.01	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	14	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Water Analysis Report

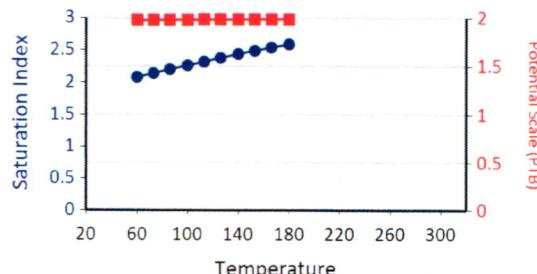
Calcium Carbonate



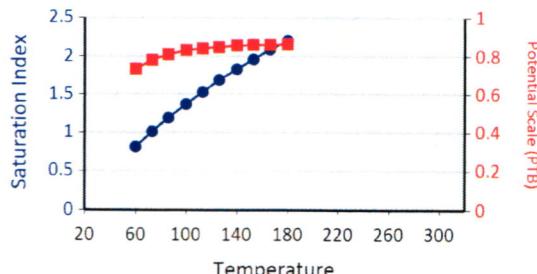
Barium Sulfate



Iron Carbonate



Zinc Carbonate



## Water Analysis Report

Production Company: PETROGLYPH OPERATING CO INC - EBUS  
 Well Name: UTE TRIBAL 21-11 SATELLITE, DUCHESNE  
 Sample Point: PLANT DISCHARGE COMPLETE  
 Sample Date: 4/21/2015  
 Sample ID: WA-307071

Sales Rep: James Patry  
 Lab Tech: Gary Winegar

Scaling potential predicted using ScaleSoftPitzer from  
 Brine Chemistry Consortium (Rice University)

Sample Specifics		Analysis @ Properties in Sample Specifics											
Test Date:	4/21/2015	Cations				mg/L				Anions			
System Temperature 1 (°F):	60.00	Sodium (Na):				5585.76	Chloride (Cl):						7000.00
System Pressure 1 (psig):	14.70	Potassium (K):				55.43	Sulfate (SO <sub>4</sub> ):						277.00
System Temperature 2 (°F):	180.00	Magnesium (Mg):				10.62	Bicarbonate (HCO <sub>3</sub> ):						2684.00
System Pressure 2 (psig):	2000.00	Calcium (Ca):				30.52	Carbonate (CO <sub>3</sub> ):						
Calculated Density (g/ml):	1.0081	Strontium (Sr):				6.47	Acetic Acid (CH <sub>3</sub> COO):						
pH:	8.70	Barium (Ba):				1.02	Propionic Acid (C <sub>3</sub> H <sub>5</sub> COO):						
Calculated TDS (mg/L):	15659.01	Iron (Fe):				1.09	Butanoic Acid (C <sub>3</sub> H <sub>7</sub> COO):						
CO <sub>2</sub> in Gas (%):		Zinc (Zn):				6.88	Isobutyric Acid ((CH <sub>3</sub> ) <sub>2</sub> CHCOO):						
Dissolved CO <sub>2</sub> (mg/L):	0.00	Lead (Pb):				0.08	Fluoride (F):						
H <sub>2</sub> S in Gas (%):		Ammonia NH <sub>3</sub> :					Bromine (Br):						
H <sub>2</sub> S in Water (mg/L):	35.00	Manganese (Mn):				0.14	Silica (SiO <sub>2</sub> ):						

## Notes:

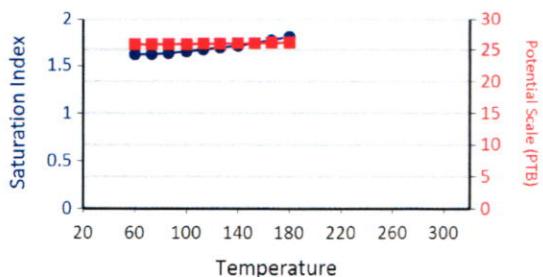
(PTB = Pounds per Thousand Barrels)

Calcium Carbonate				Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO <sub>4</sub> -2H <sub>2</sub> O		Celestite SrSO <sub>4</sub>		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	1.81	26.18	0.28	0.29	3.60	0.60	2.44	0.79	0.00	0.00	0.00	0.00	0.00	0.00	11.37	3.59
166	1779	1.77	26.13	0.33	0.32	3.61	0.60	2.40	0.79	0.00	0.00	0.00	0.00	0.00	0.00	11.52	3.59
153	1558	1.74	26.09	0.39	0.36	3.63	0.60	2.35	0.79	0.00	0.00	0.00	0.00	0.00	0.00	11.68	3.59
140	1338	1.71	26.05	0.45	0.39	3.67	0.60	2.30	0.79	0.00	0.00	0.00	0.00	0.00	0.00	11.86	3.59
126	1117	1.69	26.00	0.53	0.43	3.72	0.60	2.25	0.79	0.00	0.00	0.00	0.00	0.00	0.00	12.05	3.59
113	897	1.67	25.97	0.62	0.46	3.79	0.60	2.20	0.79	0.00	0.00	0.00	0.00	0.00	0.00	12.27	3.59
100	676	1.65	25.93	0.72	0.49	3.87	0.60	2.14	0.79	0.00	0.00	0.00	0.00	0.00	0.00	12.50	3.59
86	455	1.63	25.91	0.84	0.52	3.97	0.60	2.08	0.79	0.00	0.00	0.00	0.00	0.00	0.00	12.76	3.59
73	235	1.62	25.88	0.97	0.54	4.09	0.60	2.02	0.79	0.00	0.00	0.00	0.00	0.00	0.00	13.04	3.59
60	14	1.62	25.87	1.12	0.56	4.23	0.60	1.96	0.79	0.00	0.00	0.00	0.00	0.00	0.00	13.34	3.59

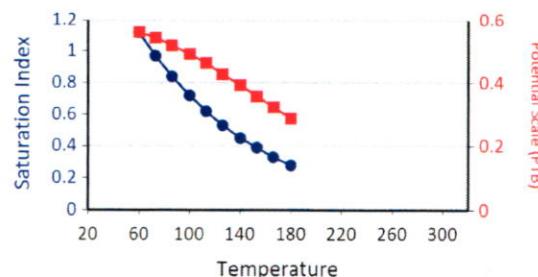
Hemihydrate CaSO <sub>4</sub> ·0.5H <sub>2</sub> O				Anhydrate CaSO <sub>4</sub>				Calcium Fluoride				Zinc Carbonate				Lead Sulfide				Mg Silicate				Ca Mg Silicate				Fe Silicate			
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB		
180	2000	0.00	0.00	0.00	0.00	0.00	0.00	3.15	4.62	10.72	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
166	1779	0.00	0.00	0.00	0.00	0.00	0.00	3.04	4.62	10.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
153	1558	0.00	0.00	0.00	0.00	0.00	0.00	2.92	4.62	11.24	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
140	1338	0.00	0.00	0.00	0.00	0.00	0.00	2.79	4.62	11.54	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
126	1117	0.00	0.00	0.00	0.00	0.00	0.00	2.65	4.62	11.86	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
113	897	0.00	0.00	0.00	0.00	0.00	0.00	2.50	4.61	12.21	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
100	676	0.00	0.00	0.00	0.00	0.00	0.00	2.34	4.61	12.60	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
86	455	0.00	0.00	0.00	0.00	0.00	0.00	2.17	4.60	13.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
73	235	0.00	0.00	0.00	0.00	0.00	0.00	1.99	4.58	13.46	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
60	14	0.00	0.00	0.00	0.00	0.00	0.00	1.79	4.55	13.95	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			

Water Analysis Report

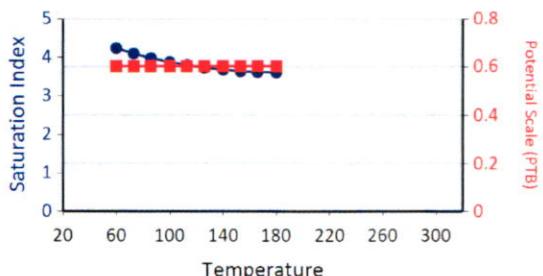
Calcium Carbonate



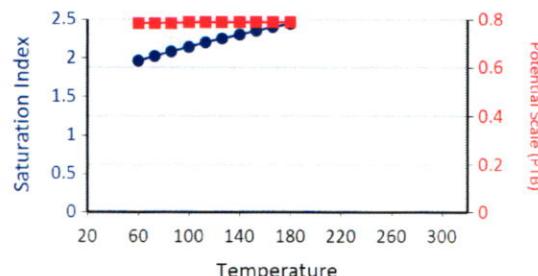
Barium Sulfate



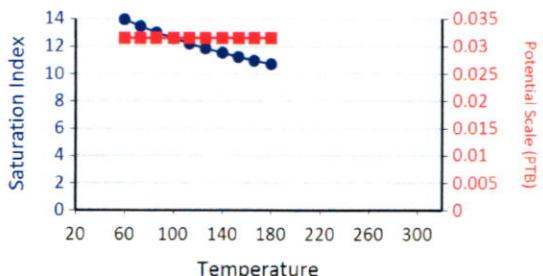
Iron Sulfide



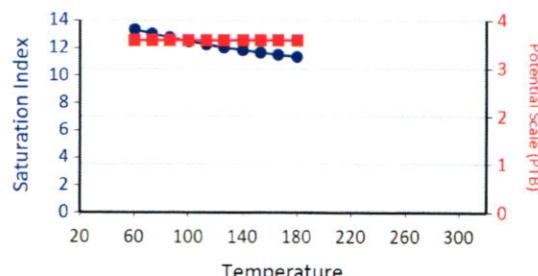
Iron Carbonate



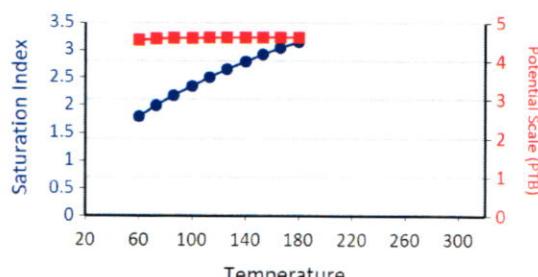
Lead Sulfide



Zinc Sulfide



Zinc Carbonate



## Water Analysis Report

Production Company: PETROGLYPH OPERATING CO INC - EBUS  
 Well Name: UTE TRIBAL 34-12D3 SATELLITE, DUCHE  
 Sample Point: PLANT DISCHARGE  
 Sample Date: 4/21/2015  
 Sample ID: WA-307067

Sales Rep: James Patry  
 Lab Tech: Gary Winegar

Scaling potential predicted using ScaleSoftPitzer from  
 Brine Chemistry Consortium (Rice University)

Sample Specifics	
Test Date:	4/21/2015
System Temperature 1 (°F):	60.00
System Pressure 1 (psig):	14.70
System Temperature 2 (°F):	180.00
System Pressure 2 (psig):	2000.00
Calculated Density (g/ml):	1.0073
pH:	8.50
Calculated TDS (mg/L):	14589.98
CO2 in Gas (%):	
Dissolved CO2 (mg/L):	0.00
H2S in Gas (%):	
H2S in Water (mg/L):	0.00

Analysis @ Properties in Sample Specifics			
Cations	mg/L	Anions	mg/L
Sodium (Na):	5277.36	Chloride (Cl):	7000.00
Potassium (K):	65.03	Sulfate (SO4):	0.00
Magnesium (Mg):	7.80	Bicarbonate (HCO3):	2196.00
Calcium (Ca):	24.60	Carbonate (CO3):	
Strontium (Sr):	5.20	Acetic Acid (CH3COO):	
Barium (Ba):	12.37	Propionic Acid (C2H5COO):	
Iron (Fe):	0.34	Butanoic Acid (C3H7COO):	
Zinc (Zn):	1.16	Isobutyric Acid ((CH3)2CHCOO):	
Lead (Pb):	0.04	Fluoride (F):	
Ammonia NH3:		Bromine (Br):	
Manganese (Mn):	0.08	Silica (SiO2):	

## Notes:

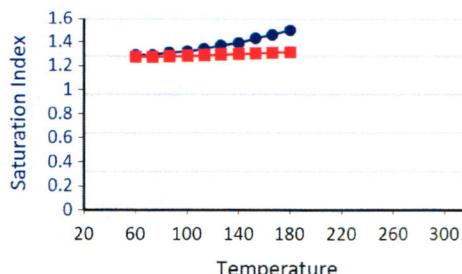
(PTB = Pounds per Thousand Barrels)

Temp (°F)	PSI	Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
		SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	1.50	20.58	0.00	0.00	0.00	0.00	1.72	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
166	1779	1.46	20.48	0.00	0.00	0.00	0.00	1.67	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153	1558	1.43	20.39	0.00	0.00	0.00	0.00	1.63	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	1338	1.39	20.30	0.00	0.00	0.00	0.00	1.57	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
126	1117	1.37	20.21	0.00	0.00	0.00	0.00	1.52	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	897	1.34	20.13	0.00	0.00	0.00	0.00	1.46	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	676	1.32	20.05	0.00	0.00	0.00	0.00	1.40	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	455	1.31	19.99	0.00	0.00	0.00	0.00	1.34	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	235	1.29	19.93	0.00	0.00	0.00	0.00	1.28	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	14	1.29	19.93	0.00	0.00	0.00	0.00	1.22	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

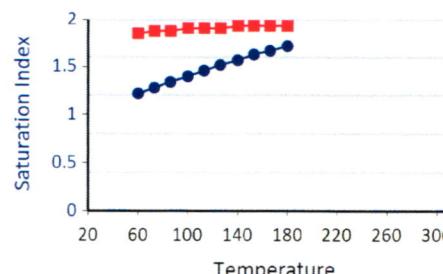
Temp (°F)	PSI	Hemihydrate CaSO4·0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
		SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	0.00	0.00	0.00	0.00	0.00	0.00	2.16	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
166	1779	0.00	0.00	0.00	0.00	0.00	0.00	2.05	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153	1558	0.00	0.00	0.00	0.00	0.00	0.00	1.93	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	1338	0.00	0.00	0.00	0.00	0.00	0.00	1.80	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
126	1117	0.00	0.00	0.00	0.00	0.00	0.00	1.65	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	897	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	676	0.00	0.00	0.00	0.00	0.00	0.00	1.34	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	455	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	235	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	14	0.00	0.00	0.00	0.00	0.00	0.79	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Water Analysis Report

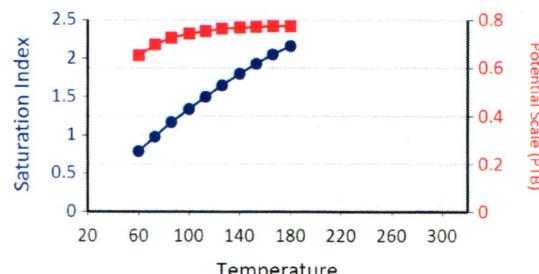
Calcium Carbonate



Iron Carbonate



Zinc Carbonate



**Water Analysis Report**

Production Company: PETROGLYPH OPERATING CO INC - EBUS

Well Name: UTE TRIBAL 04-02 INJ, DUCHESNE

Sample Point: WELLHEAD

Sample Date: 1/7/2015

Sample ID: WA-297432

Sales Rep: James Patry

Lab Tech: Gary Winegar

Scaling potential predicted using ScaleSoftPitzer from  
Brine Chemistry Consortium (Rice University)

Sample Specifics		Analysis @ Properties in Sample Specifics									
		Cations				mg/L		Anions			
Test Date:	1/14/2015	Sodium (Na):				1669.67		Chloride (Cl):			3000.00
System Temperature 1 (°F):	160	Potassium (K):				28.52		Sulfate (SO4):			216.00
System Pressure 1 (psig):	1300	Magnesium (Mg):				51.13		Bicarbonate (HCO3):			1220.00
System Temperature 2 (°F):	80	Calcium (Ca):				105.79		Carbonate (CO3):			
System Pressure 2 (psig):	15	Strontium (Sr):				4.42		Acetic Acid (CH3COO):			
Calculated Density (g/ml):	1.0016	Barium (Ba):				0.79		Propionic Acid (C2H5COO):			
pH:	6.50	Iron (Fe):				4.50		Butanoic Acid (C3H7COO):			
Calculated TDS (mg/L):	6328.99	Zinc (Zn):				0.70		Isobutyric Acid ((CH3)2CHCOO):			
CO2 in Gas (%):		Lead (Pb):				0.10		Fluoride (F):			
Dissolved CO2 (mg/L):	40.00	Ammonia NH3:						Bromine (Br):			
H2S in Gas (%):		Manganese (Mn):				0.06		Silica (SiO2):			27.31
H2S in Water (mg/L):	5.00										

**Notes:**

B=3.39 Al=.02 Li=1.14

(PTB = Pounds per Thousand Barrels)

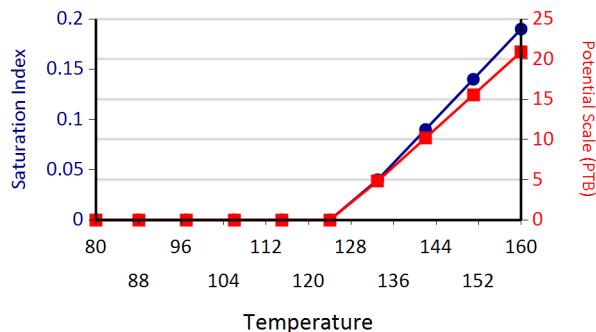
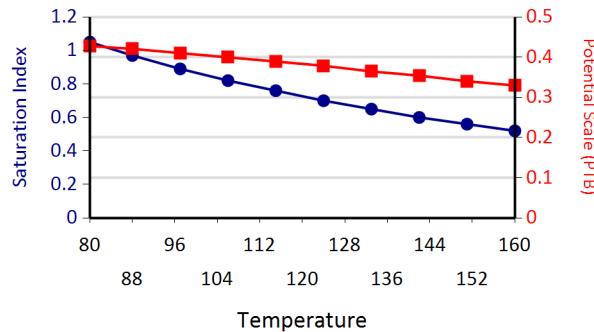
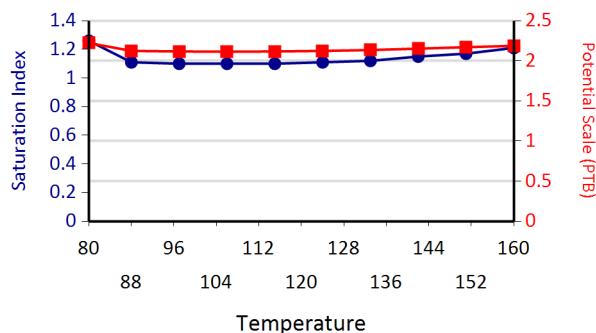
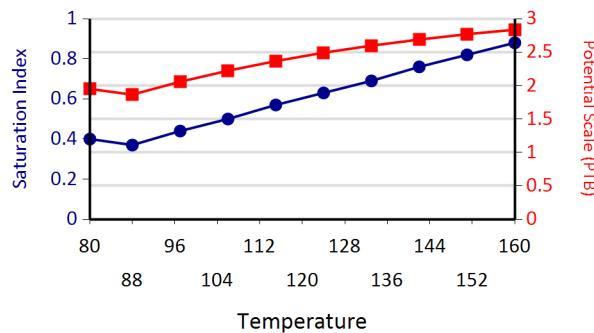
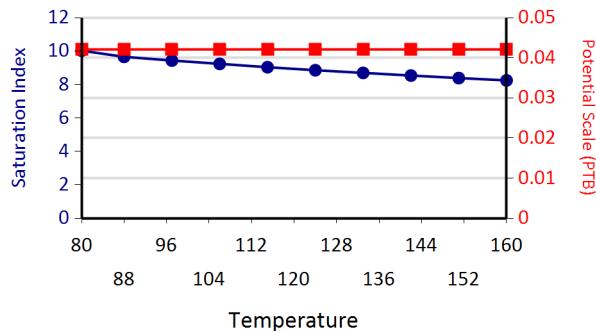
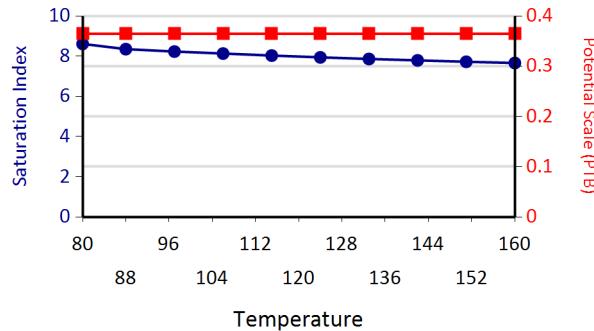
		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
80.00	14.00	0.00	0.00	1.05	0.43	1.26	2.22	0.40	1.95	0.00	0.00	0.00	0.00	0.00	0.00	8.61	0.36
88.00	157.00	0.00	0.00	0.97	0.42	1.11	2.12	0.37	1.86	0.00	0.00	0.00	0.00	0.00	0.00	8.35	0.36
97.00	300.00	0.00	0.00	0.89	0.41	1.10	2.12	0.44	2.06	0.00	0.00	0.00	0.00	0.00	0.00	8.23	0.36
106.00	443.00	0.00	0.00	0.82	0.40	1.10	2.11	0.50	2.22	0.00	0.00	0.00	0.00	0.00	0.00	8.13	0.36
115.00	585.00	0.00	0.00	0.76	0.39	1.10	2.12	0.57	2.37	0.00	0.00	0.00	0.00	0.00	0.00	8.03	0.36
124.00	728.00	0.00	0.00	0.70	0.38	1.11	2.12	0.63	2.49	0.00	0.00	0.00	0.00	0.00	0.00	7.94	0.36
133.00	871.00	0.04	4.84	0.65	0.36	1.12	2.13	0.69	2.60	0.00	0.00	0.00	0.00	0.00	0.00	7.86	0.36
142.00	1014.00	0.09	10.19	0.60	0.35	1.15	2.15	0.76	2.69	0.00	0.00	0.00	0.00	0.00	0.00	7.79	0.36
151.00	1157.00	0.14	15.56	0.56	0.34	1.17	2.17	0.82	2.77	0.00	0.00	0.00	0.00	0.00	0.00	7.72	0.36
160.00	1300.00	0.19	20.91	0.52	0.33	1.21	2.19	0.88	2.84	0.00	0.00	0.00	0.00	0.00	0.00	7.66	0.36

		Hemihydrate CaSO4·0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
80.00	14.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00
88.00	157.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.66	0.04	0.00	0.00	0.00	0.00	0.00	0.00
97.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.44	0.04	0.00	0.00	0.00	0.00	0.00	0.00
106.00	443.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.24	0.04	0.00	0.00	0.00	0.00	0.00	0.00
115.00	585.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00
124.00	728.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86	0.04	0.00	0.00	0.00	0.00	0.00	0.00
133.00	871.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.70	0.04	0.00	0.00	0.00	0.00	0.00	0.00
142.00	1014.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.54	0.04	0.00	0.00	0.00	0.00	0.00	0.00
151.00	1157.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.39	0.04	0.00	0.00	0.00	0.00	0.00	0.00
160.00	1300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.25	0.04	0.00	0.00	0.00	0.00	0.00	0.00

## Water Analysis Report

These scales have positive scaling potential under initial temperature and pressure: Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Lead Sulfide

These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Lead Sulfide

**Calcium Carbonate****Barium Sulfate****Iron Sulfide****Iron Carbonate****Lead Sulfide****Zinc Sulfide**

**ATTACHMENT NO. 6**

**COMPLETION DATA FOR ALL WELLS IN THE AOR**

## Well Completion Data

### Ute Tribal 03-04

Well	Surface Casing				Production Casing			
	Size (inches)	Depth (ft KB)	Cement Amount (sx)	Cement Top	Size (inches)	Depth (ft KB)	Cement Amount (sx)	Estimated Cement Top
Ute Tribal 03-04	8-5/8	428	250	surface	5-1/2	6521	420	2840
Ute Tribal 04-01A	8-5/8	424	250	surface	5-1/2	6496	470	2120

**ATTACHMENT NO. 7**

**CBL FOR THE UIC WELL**

## COMPANY: PETROGLYPH OPERATING CO

WELL: UTE TRIBAL # 03-04

FIELD: ANTELOPE CREEK

COUNTRY: DUCHESNE STATE: UTAH

## CEMENT BOND LOG

**Schlumberger**

COUNTY	DUCHESNE
Field	ANTELOPE CREEK
Location	360 FNL & 460 FWL
Well:	UTE TRIBAL # 03-04
Company	PETROGLYPH OPERATING CO
LOCATION	360 FNL & 460 FWL LOT 4
Permanent Datum	GROUND LEVEL
Log Measured From	KELLY BUSHING
Drilling Measured From	KELLY BUSHING
API Serial No.	43-013-31736
SECTION	3
TOWNSHIP	5S
Range	3W
Logging Date	7 NOV 1996
Run Number	1
Depth Driller	6524 = 6463 F
Schlumberger Depth	6460 F
Bottom Log Interval	2600 F
Top Log Interval	5,500 IN
Casing Driller Size (in) Depth	7.875 IN
Casing Schlumberger	8.4 LB/G
Bit Size	(in)
Type Fluid In Hole	WATER
MUD Density	1.05
Fluid Loss	PH
Source Of Sample	
RM (in) Measured Temperature	(in)
FM (in) Measured Temperature	(in)
RMC (in) Measured Temperature	(in)
Source RMF	RMC
RM (in) MRT	RMF (in) MRT
Maximum Recorded Temperatures	(in)
Circulation Stopped	Time
Logger On Bottom	Location
Unit Number	151
Recorded By	R SHOCKEY
Witnessed By	MR. KENT STRINGHAM

*Bull Headed sack from surface*

Run 1

Run

Run 3

Run 4

(v)  
(v)  
(v)  
(v)  
(v)

All interpretations are opinions based on indications from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to clause 4 of our general terms and conditions as set out in our current price schedule.

## OTHER SERVICES1

OS1  
OS2  
OS3  
OS4  
OS5

REMARKS: RUN NUMBER 1  
LOG CORRELATED TO SWS DENSITY LOG  
DATED 31-OCT-1996  
SHORT JOINT AT 3886-3896  
EST CEMENT TOP AT  
THANK YOU FOR USING SCHLUMBERGER!

## OTHER SERVICES2

OS1  
OS2  
OS3  
OS4  
OS5

REMARKS: RUN NUMBER 2

## RUN 1

SERVICE ORDER #  
PROGRAM VERS ON  
FILED LEVEL  
LOGGED INTERVAL START STOP

## RUN 2

SERVICE ORDER #  
PROGRAM VERS ON  
FILED LEVEL  
LOGGED INTERVAL START STOP

## EQUIPMENT DESCRIPTION

## RUN 1

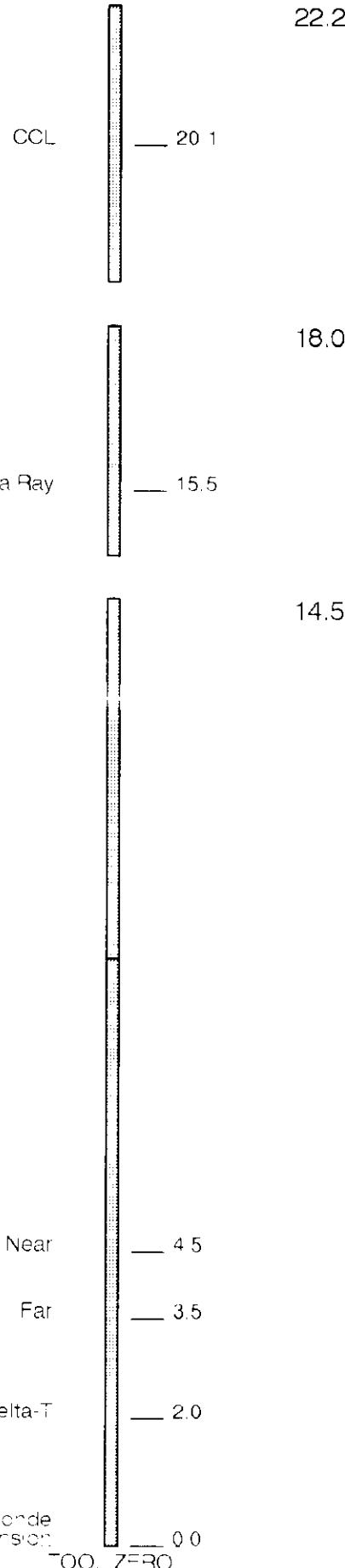
SURFACE EQUIPMENT

WDM-AB  
SMM-AA

## RUN 2

DOWNHOLE EQUIPMENT

CCL-AJ  
CCL-AJ



MAXIMUM STRING DIAMETER 1.69 IN  
MEASUREMENTS RELATIVE TO TOOL ZERO  
ALL LENGTHS IN FEET

## Output DLIS Files

DEFAULT      SLTJ .005      FN:4      FIELD      07-Nov-1996 11:31      6474.5 FT      2580.5 FT

### OP System Version: 8B0-538 MCM

SLT-J      8B0-538      SGT-G      8B0-538  
CCL-AJ      8B0-538

#### PIP SUMMARY

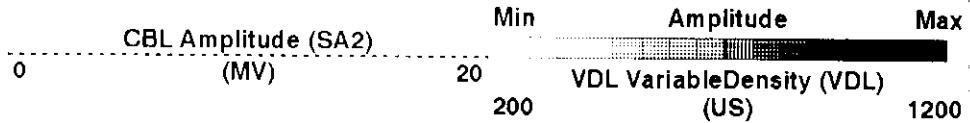
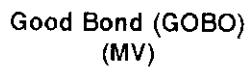
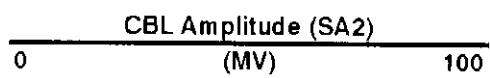
##### ↳ Casing Collars

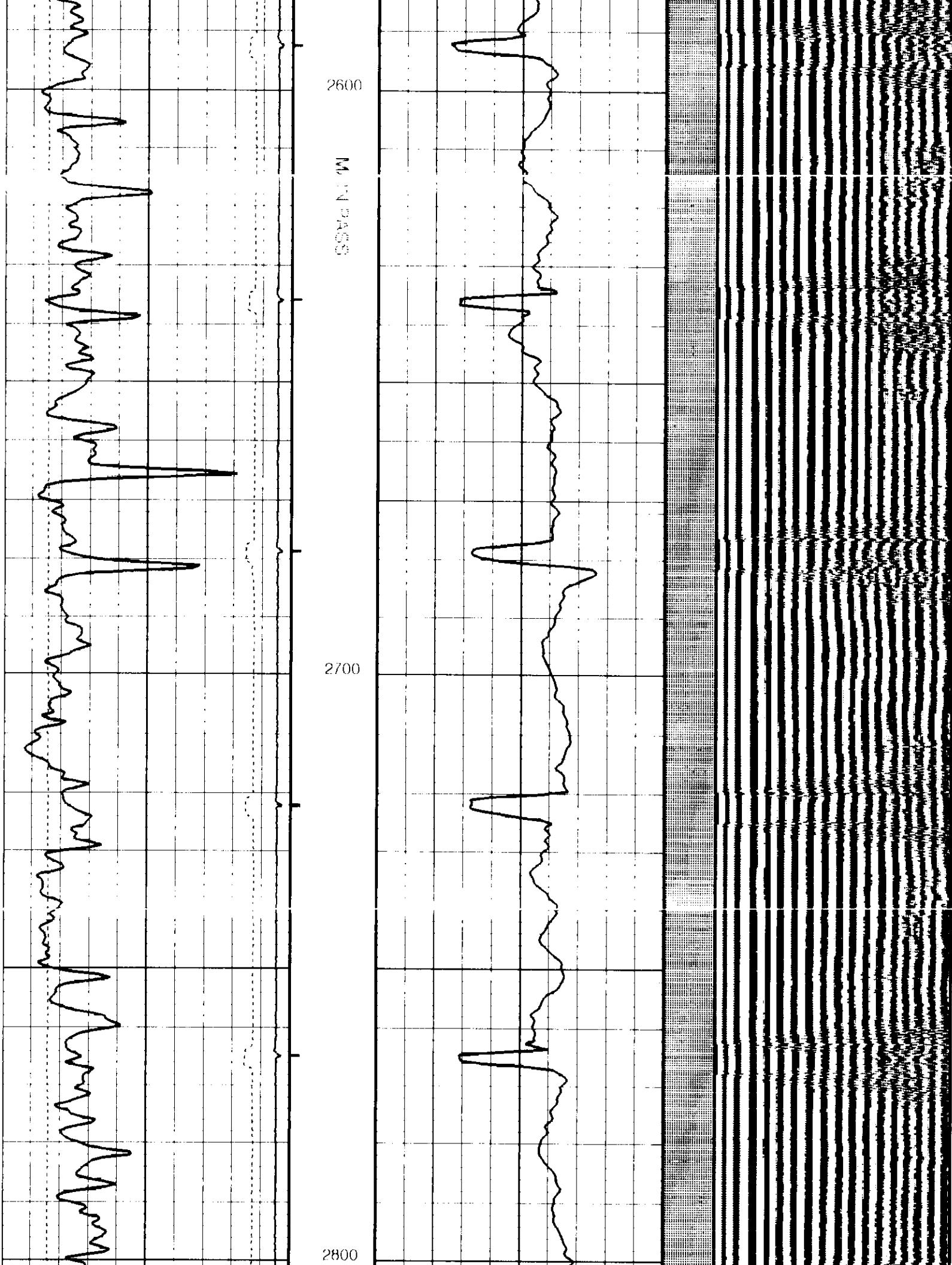
CasCollar  
From CCL to CCL

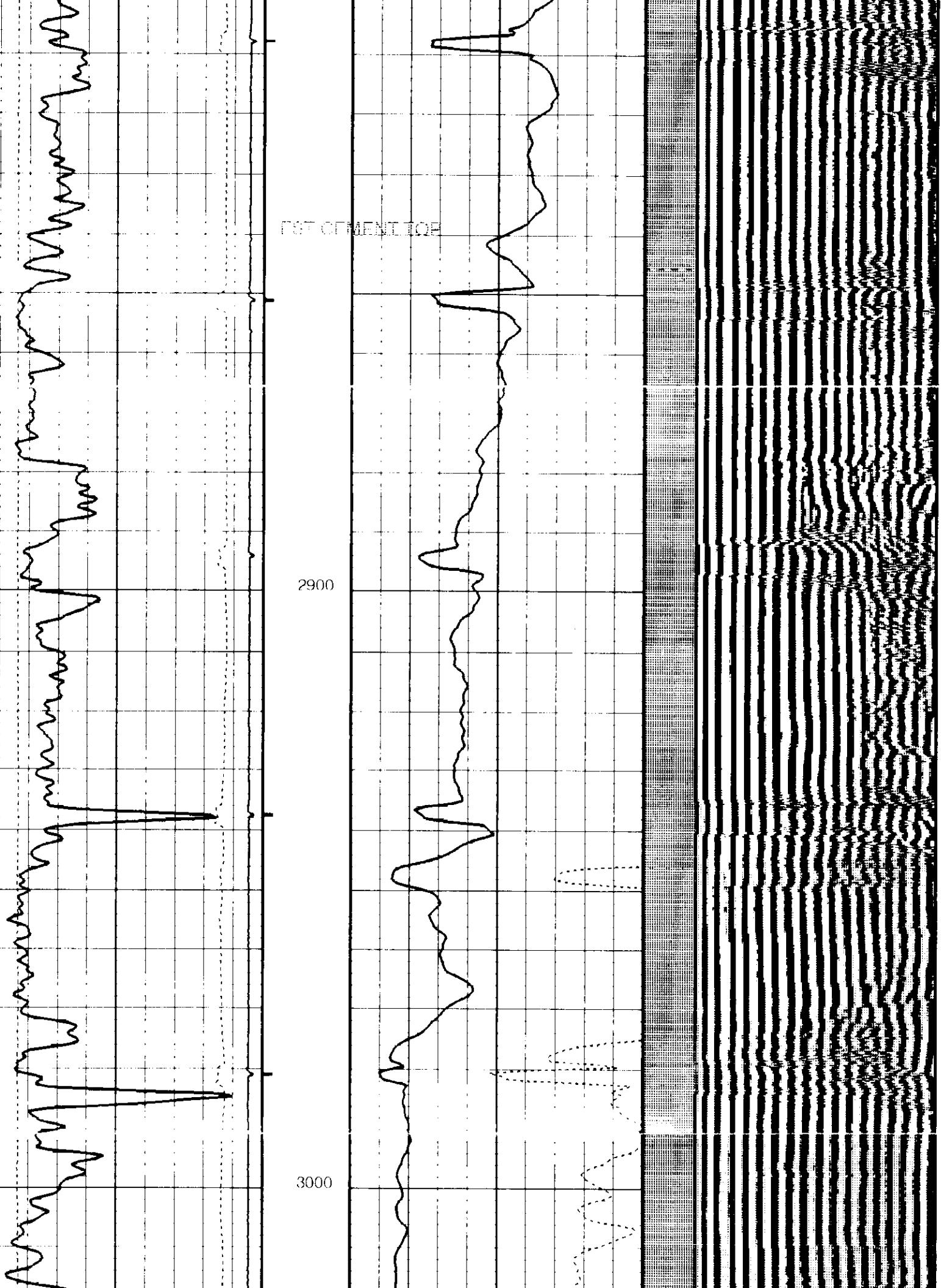
#### Gamma Ray (GR)

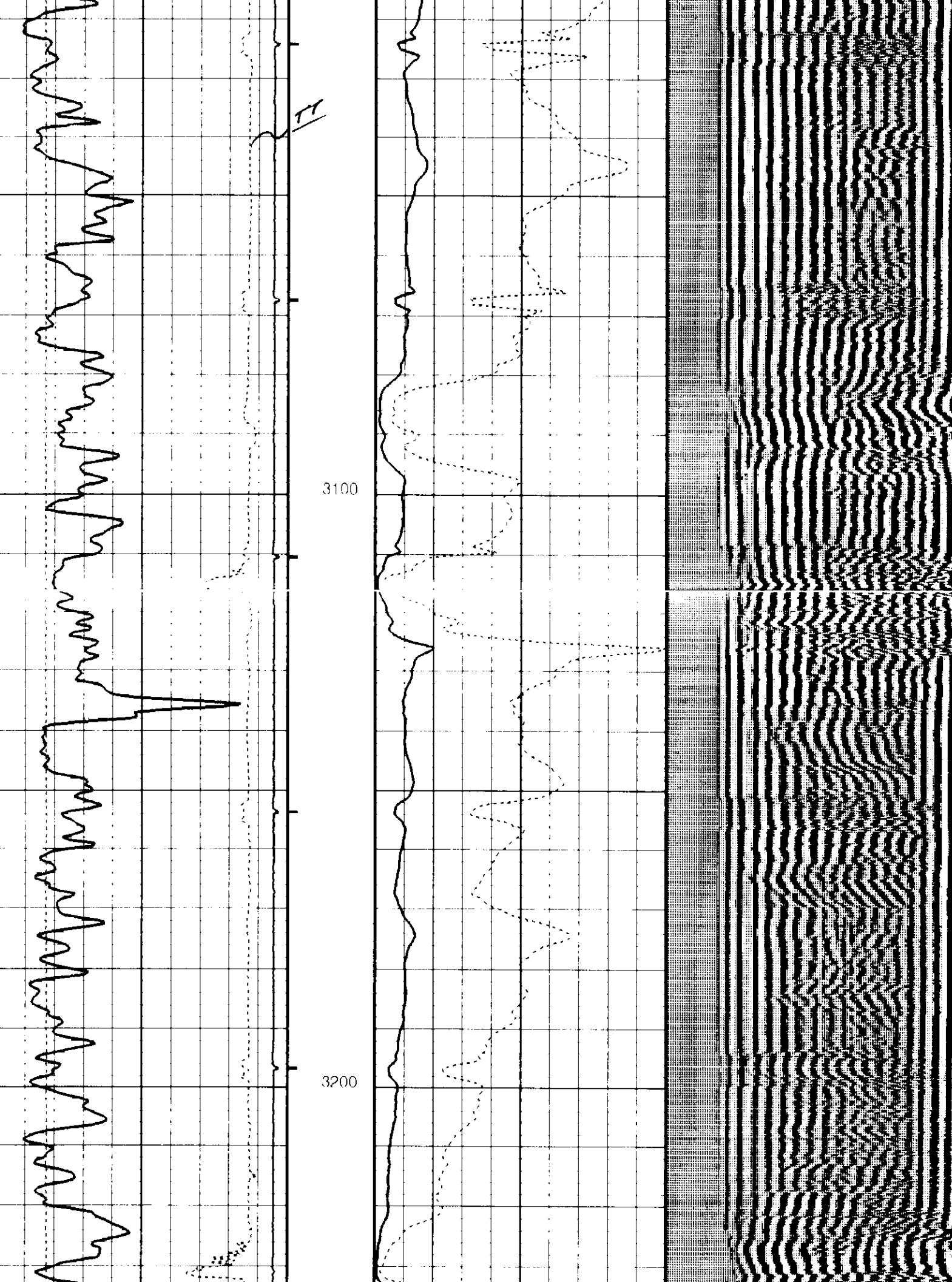
#### MAIN PASS

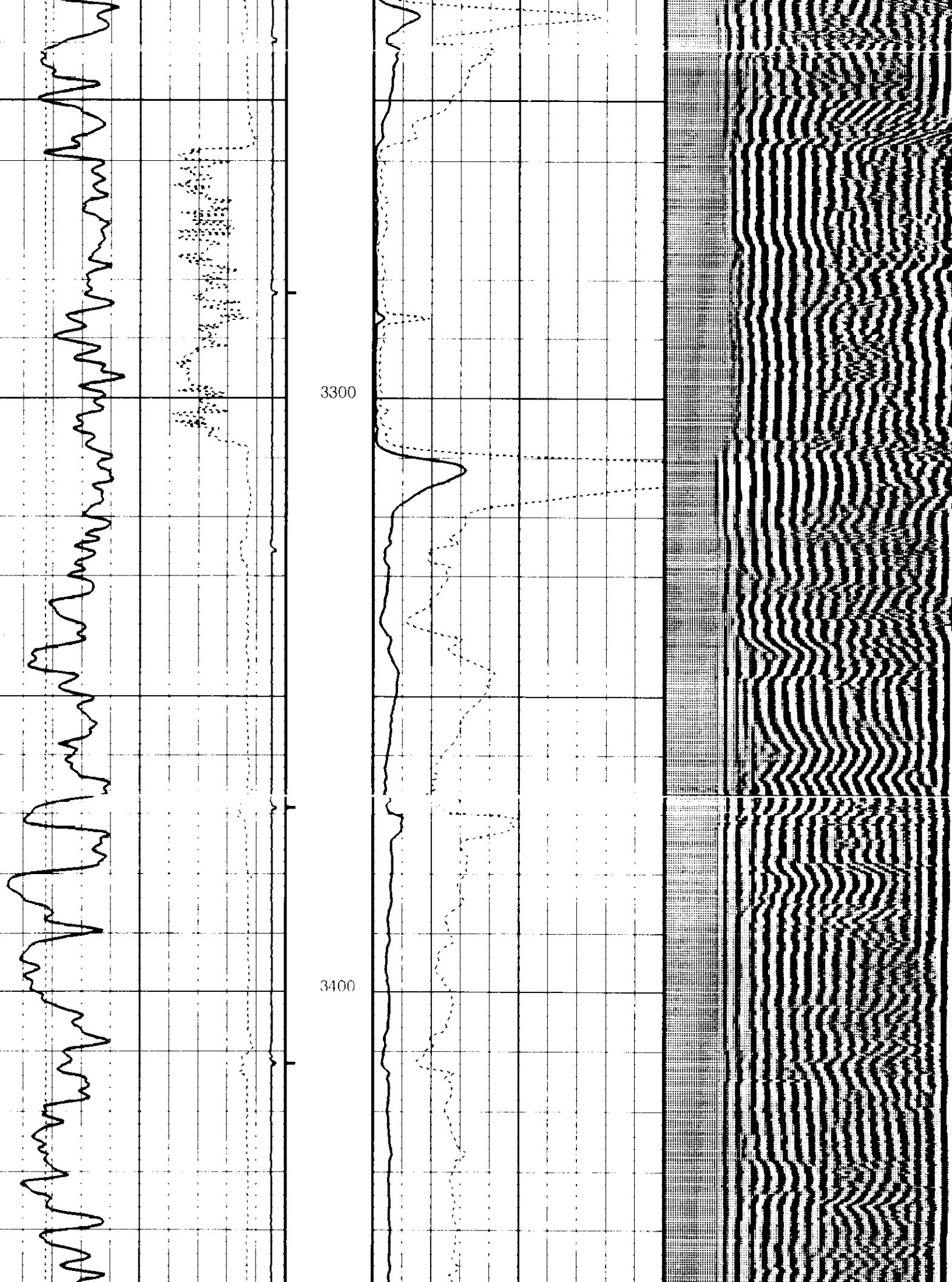
0      (GAPI)      200

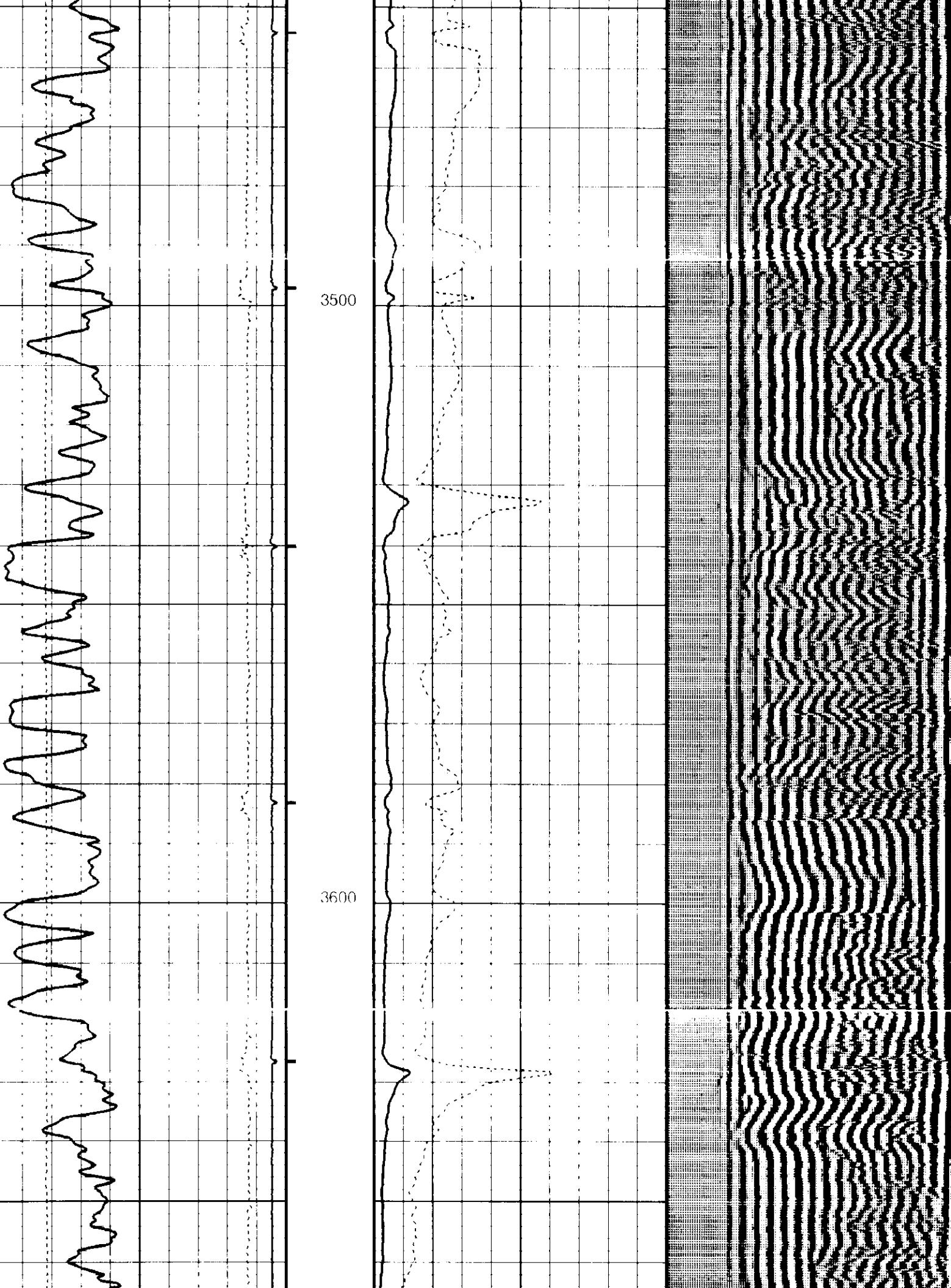


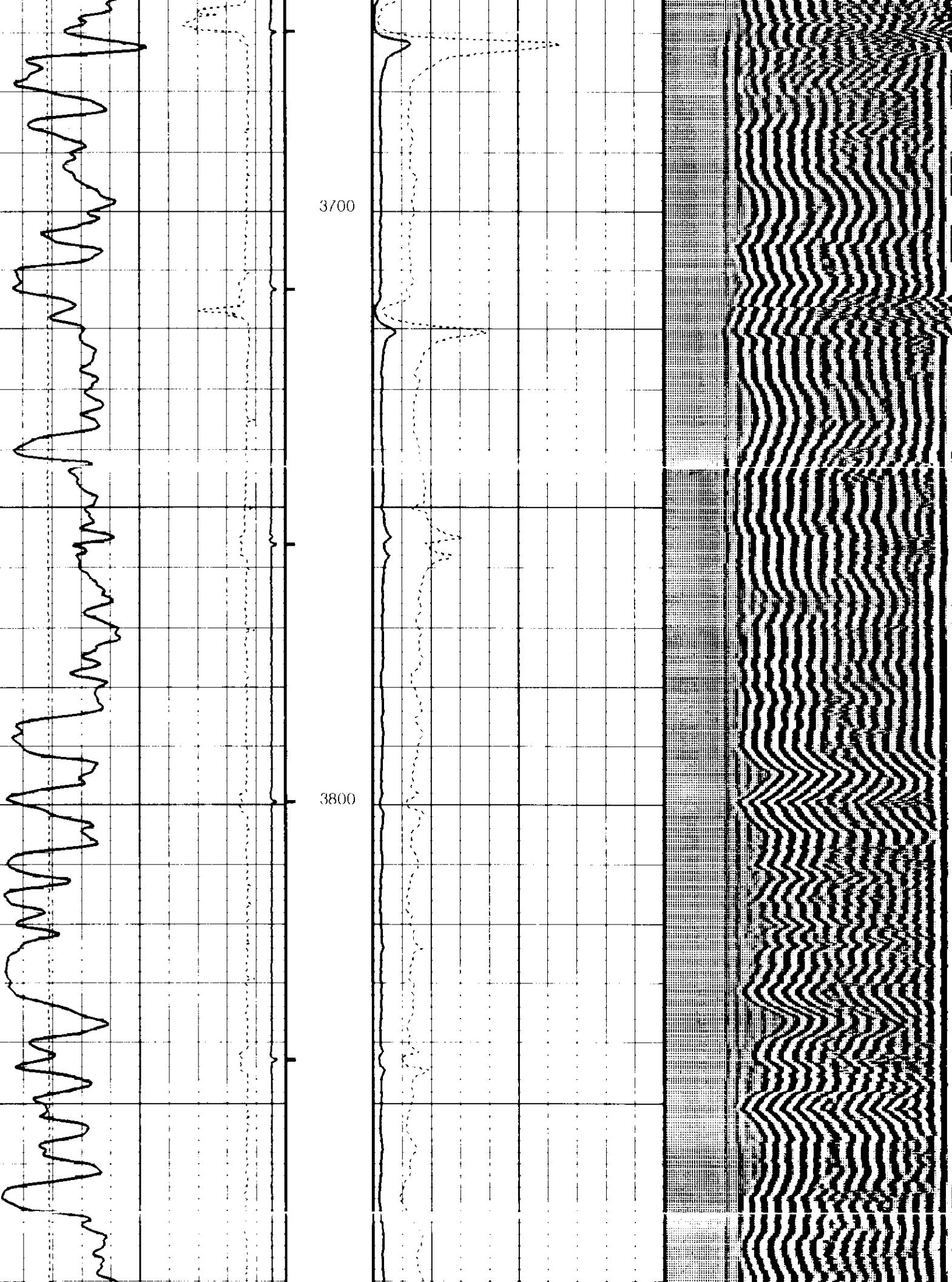


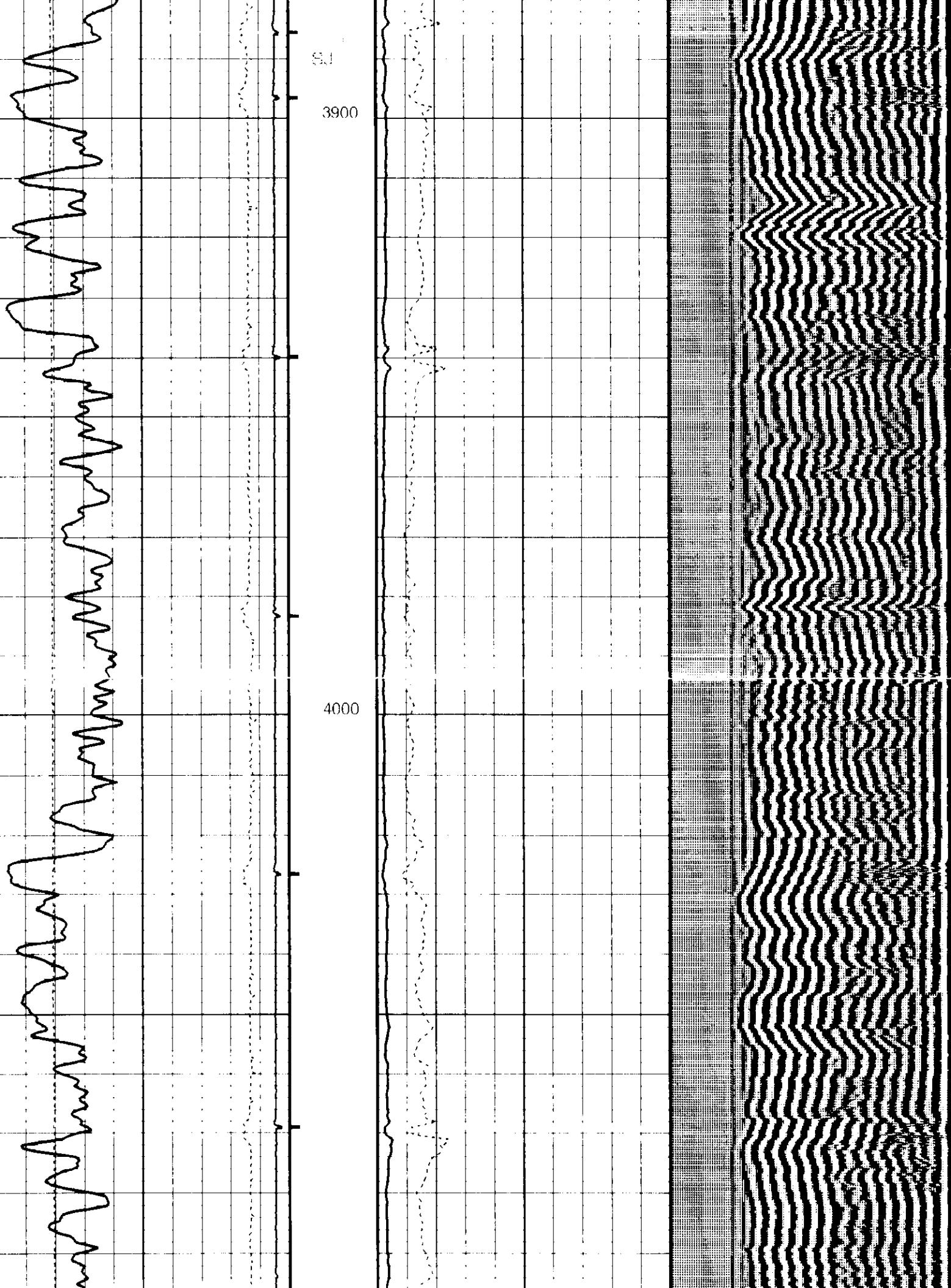


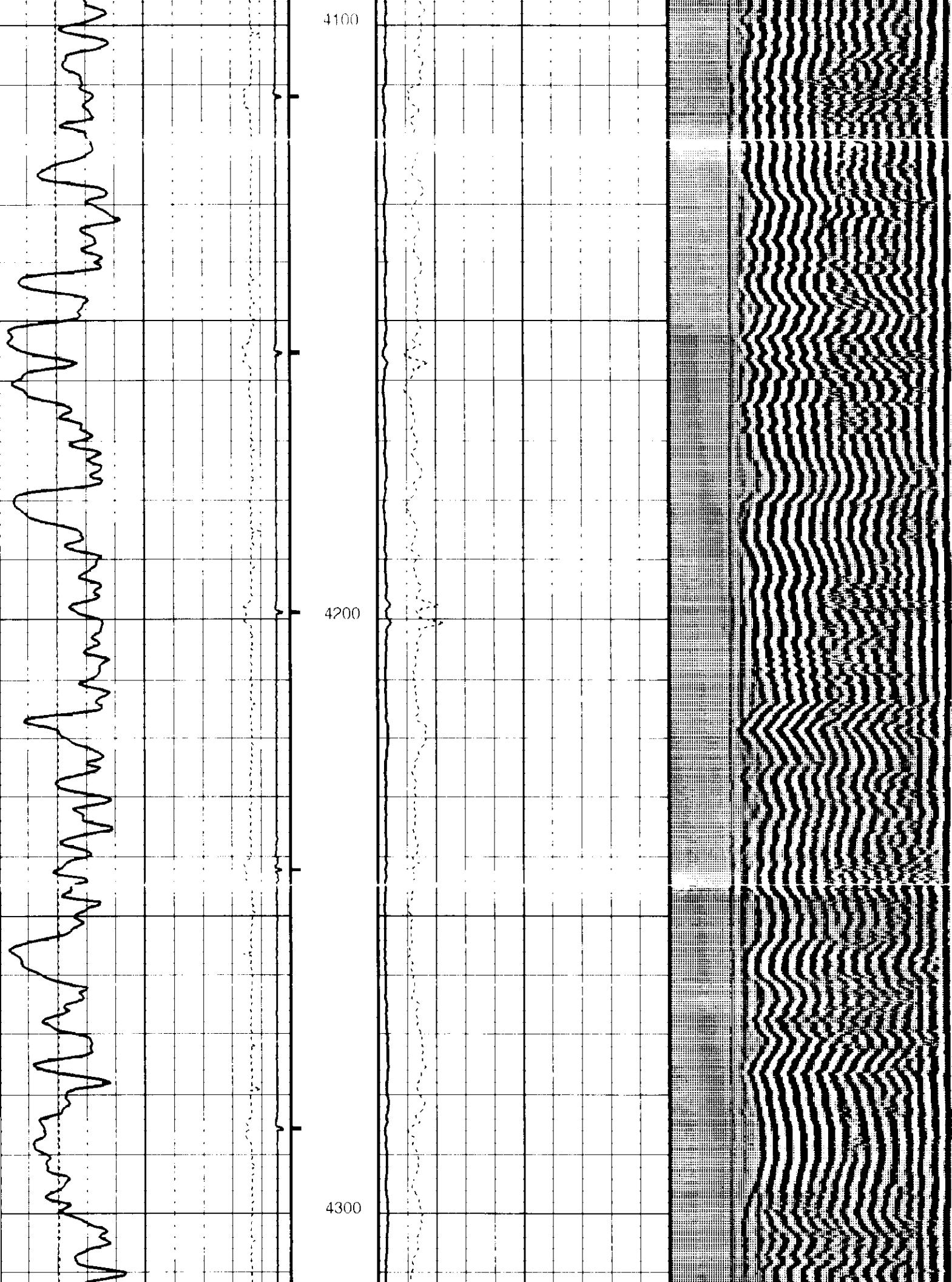


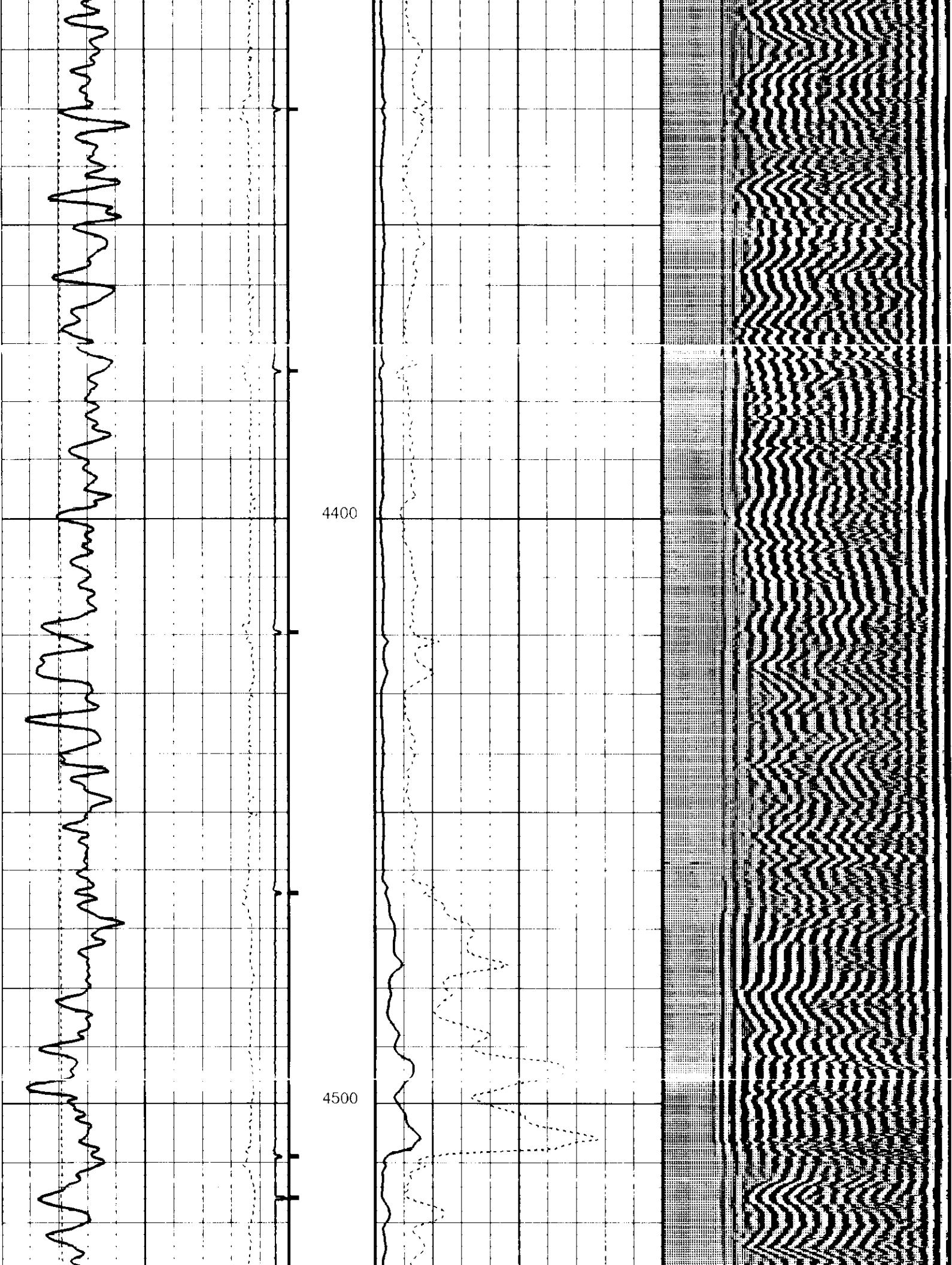


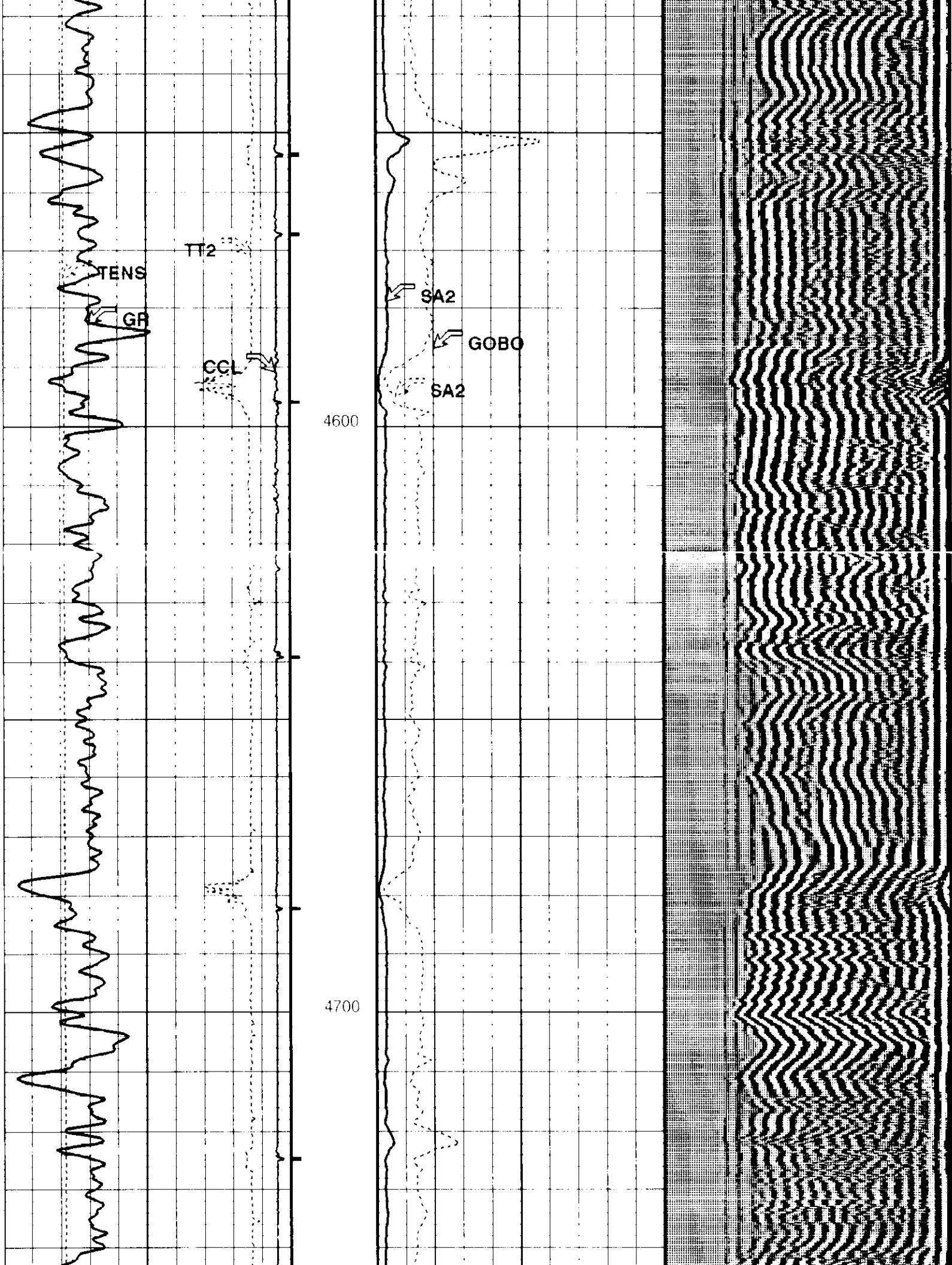


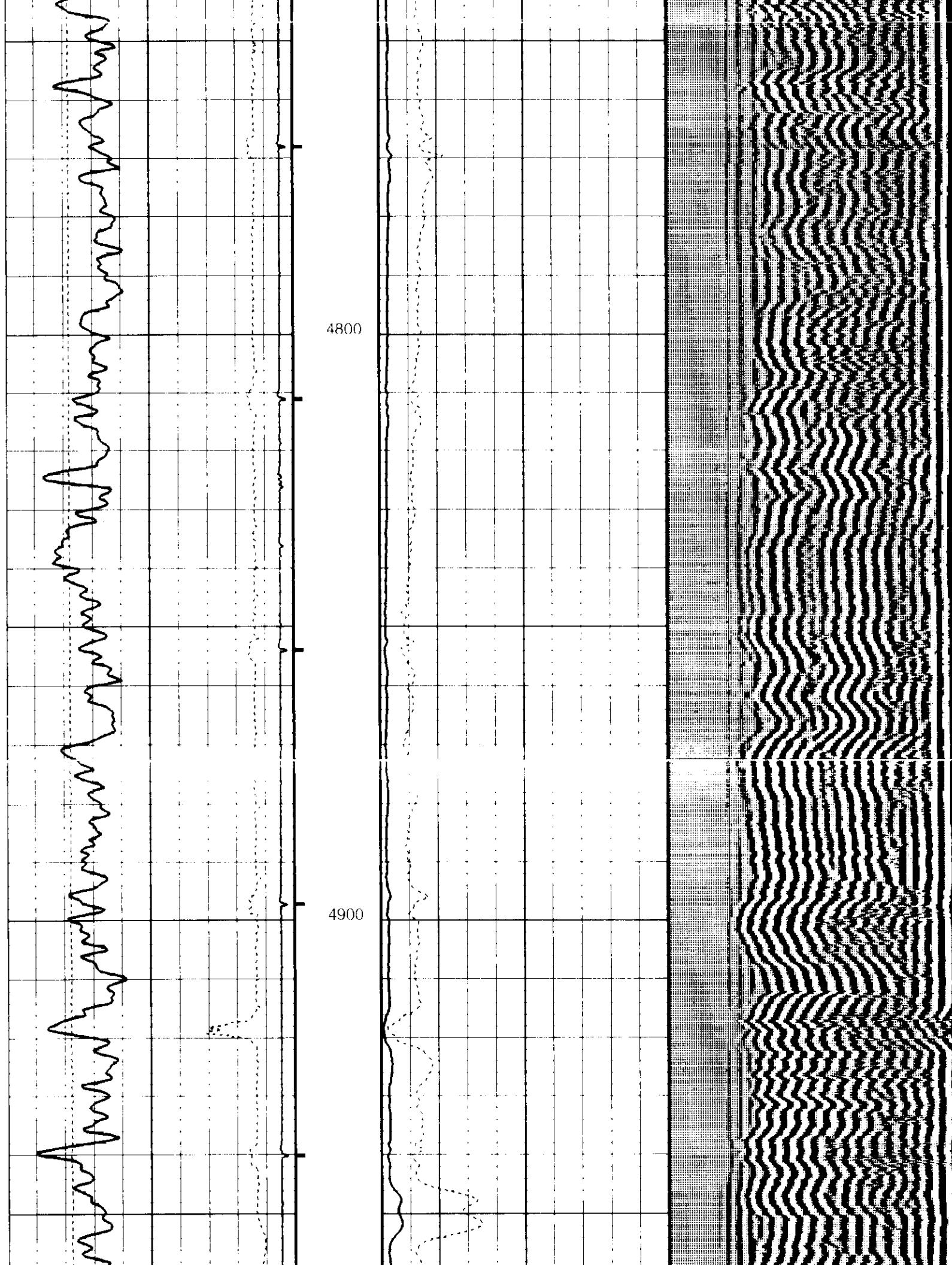


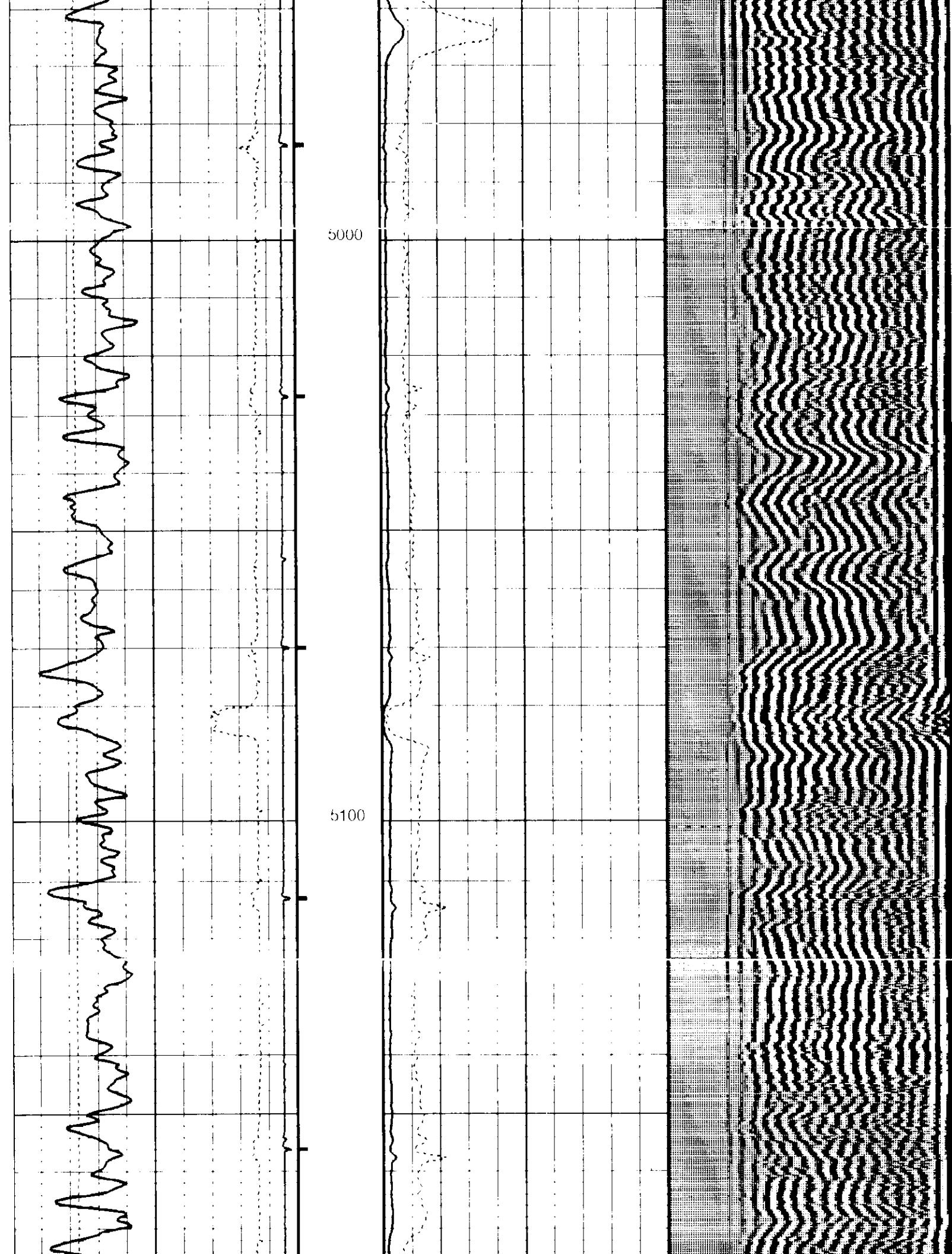


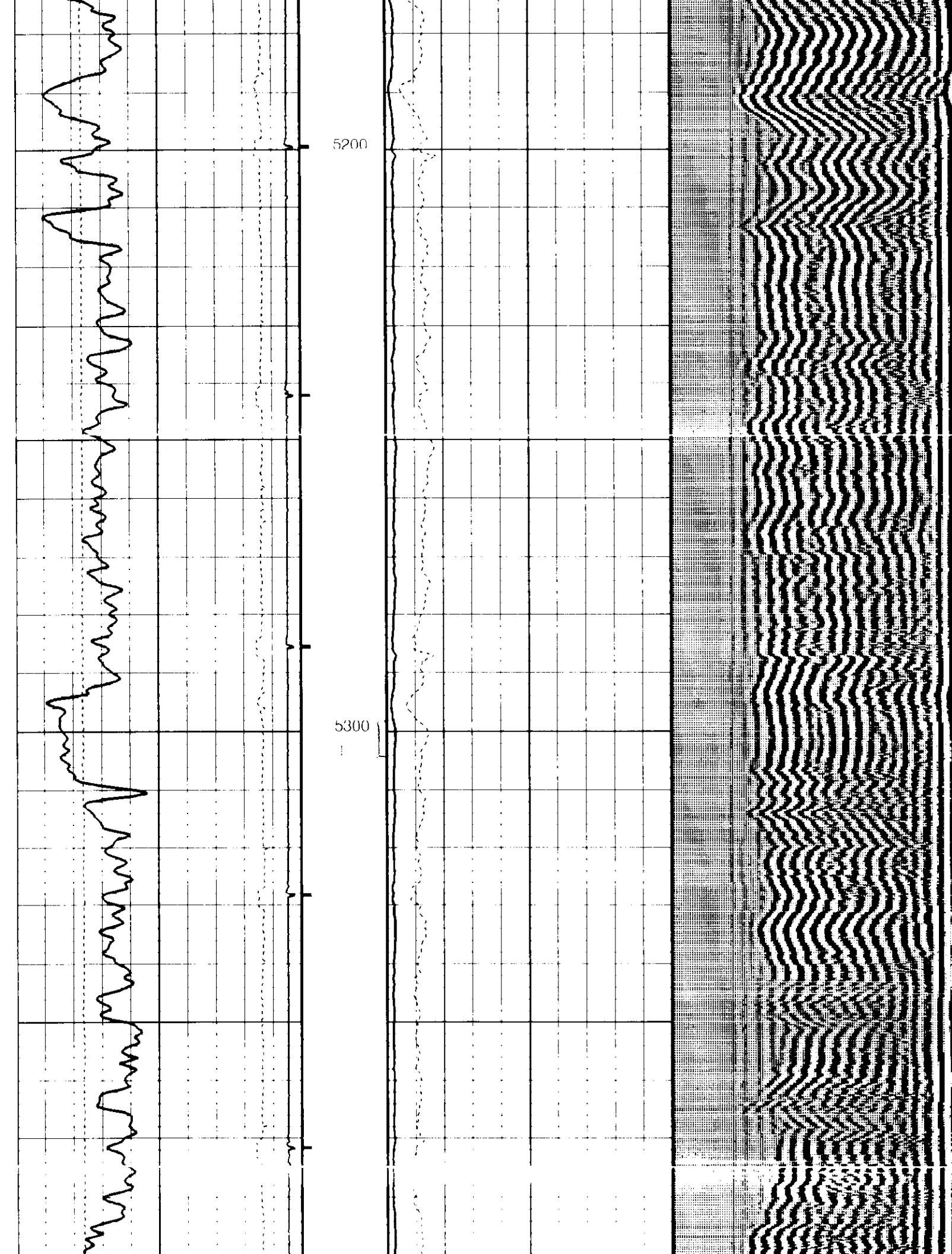


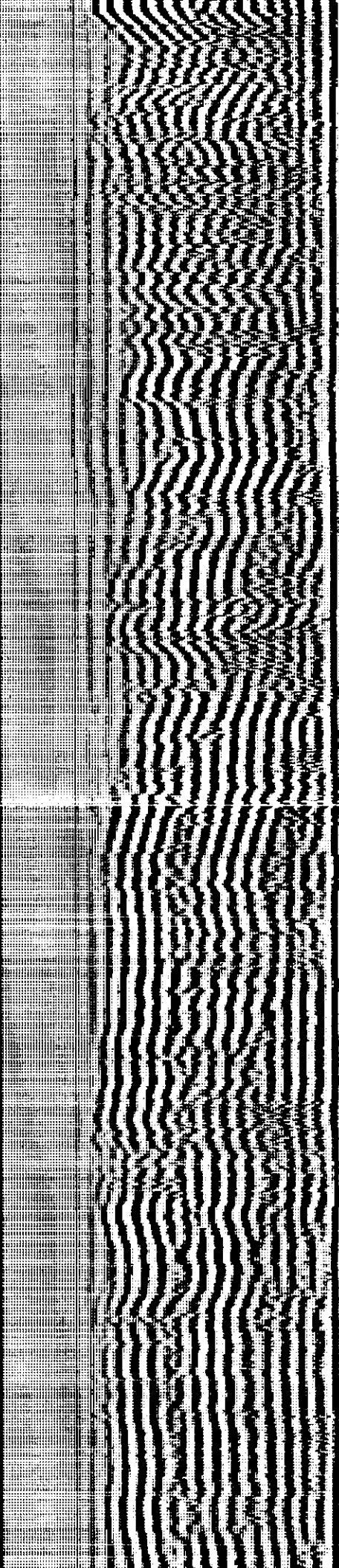








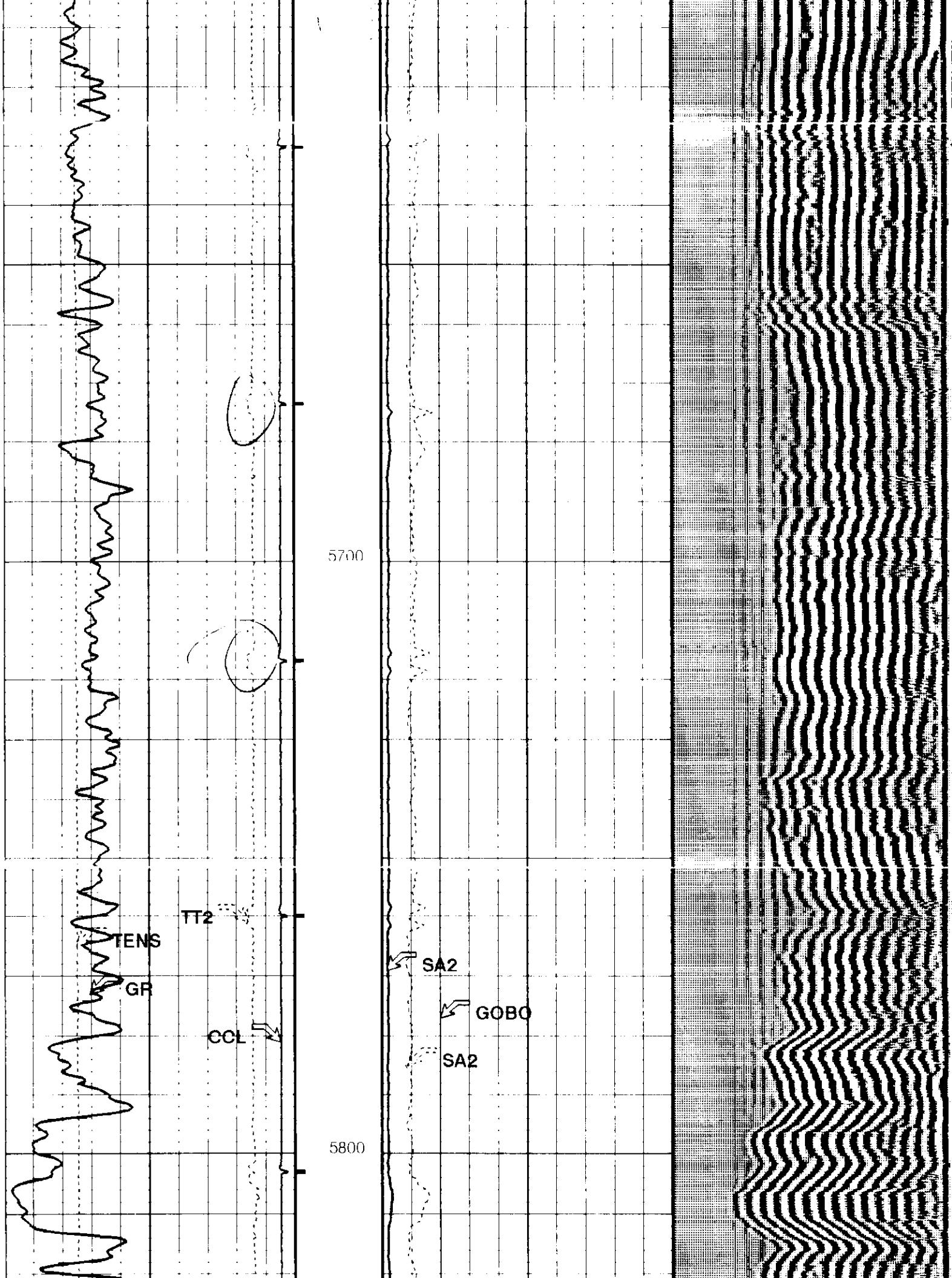


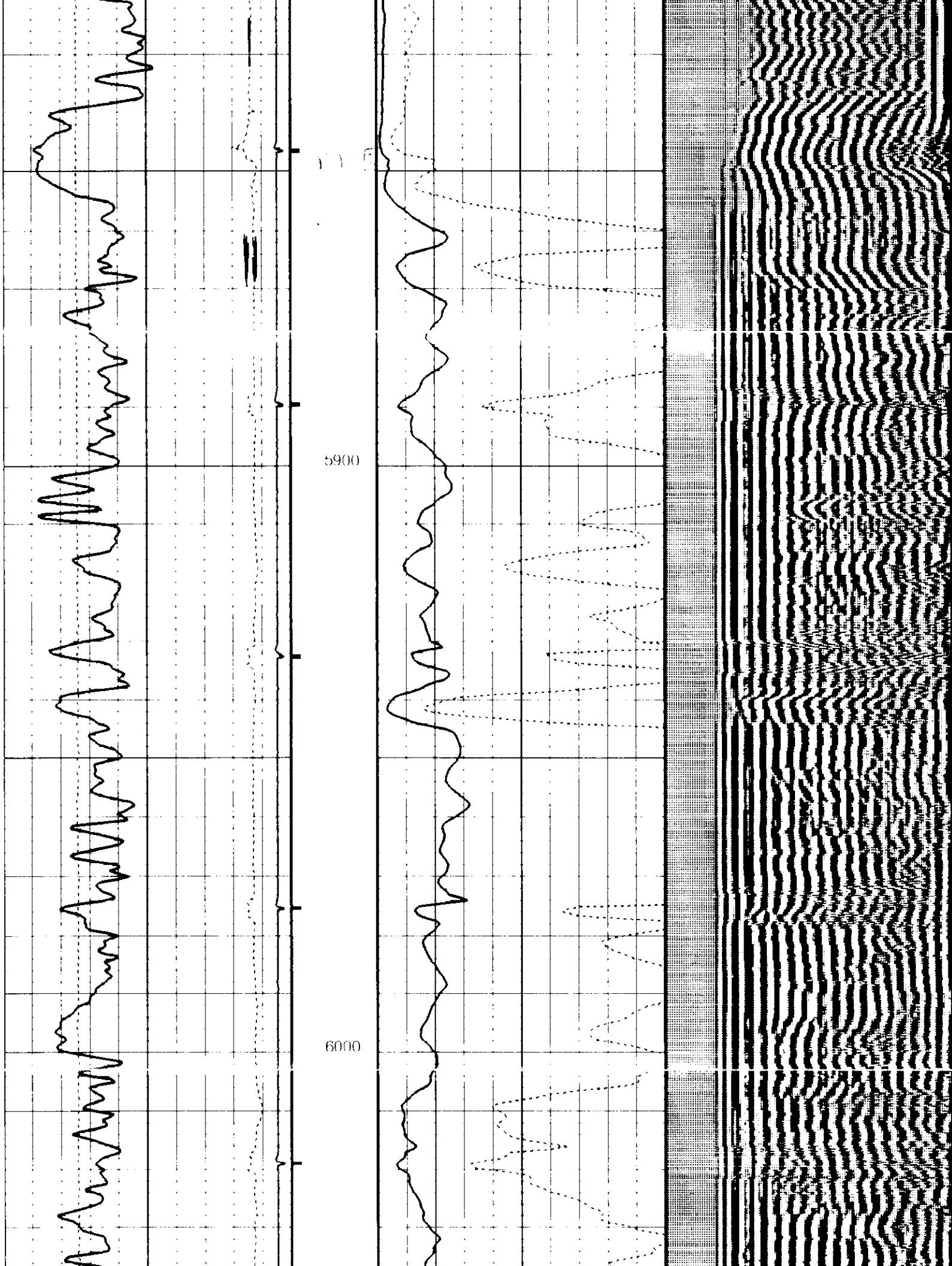


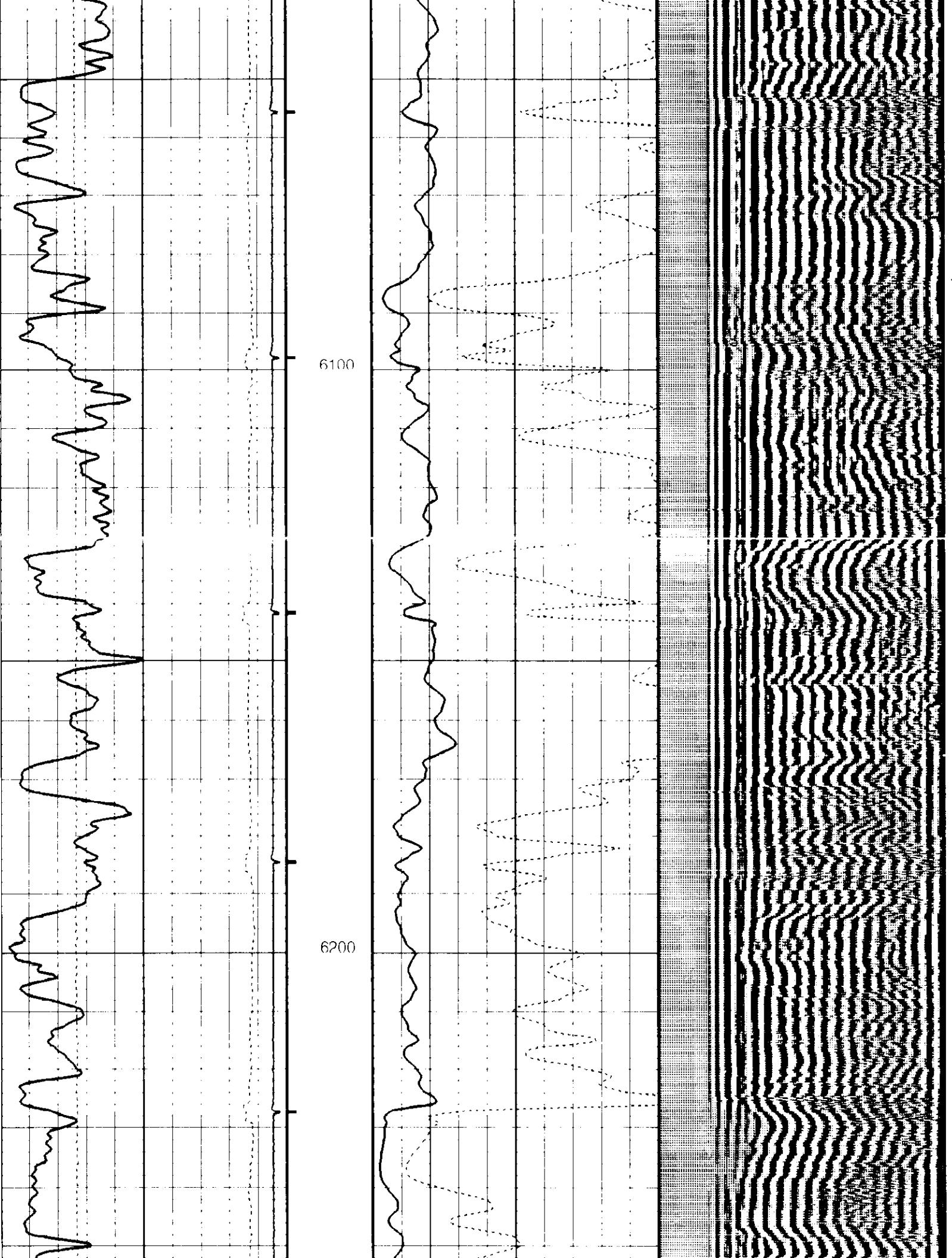
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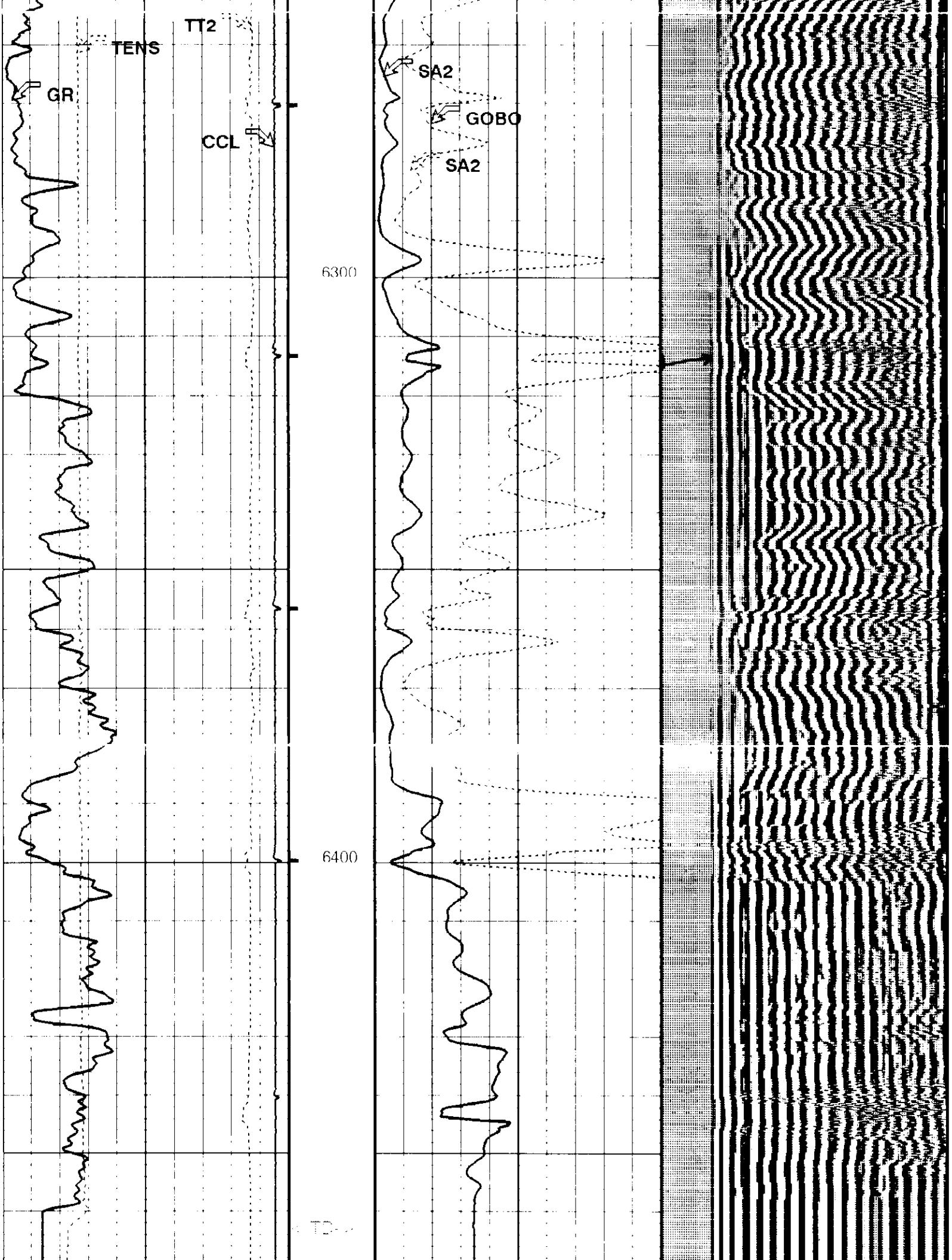
5500

5600











Tension (TENS) (LBF)	4000	CBL Amplitude (SA2) (MV)	20	Min	Amplitude	Max
Transit Time 2 (TT2) (US)	230	Good Bond (GOBO) (MV)	10	200	VDL VariableDensity (VDL) (US)	1200
Casing Collar Locator (CCL) (-19) (----)	1	CBL Amplitude (SA2) (MV)	100			
Gamma Ray (GR) 0 (GAPI)	200					

### MAIN PASS

CasCollar  
From CCL to CCL

### PIP SUMMARY

↳ Casing Collars

### Parameters

DLIS Name	Description	Value
CCLD	CCL reset delay	12 IN
CCLT	CCL detection level	0.3 V
GOBO	Good Bond	2 MV

Format: CBL\_VDL Vertical Scale: 5" per 100'

Graphics File Created: 07-Nov-1996 11:31

### OP System Version: 8B0-538 MCM

SLT-J	8B0-538	SGT-G	8B0-538
CCL-AJ	8B0-538		

### Output DLIS Files

DEFAULT	SLTJ .005	FN:4	FIELD	07-Nov-1996 11:31
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### Output DLIS Files

DEFAULT	SLTJ .004	FN:3	FIELD	07-Nov-1996 11:24	6480.5 FT	6241.1 FT
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### OP System Version: 8B0-538 MCM

SLT-J	8B0-538	SGT-G	8B0-538
CCL-AJ	8B0-538		

### PIP SUMMARY

↳ Casing Collars

CasCollar  
From CCL to CCL

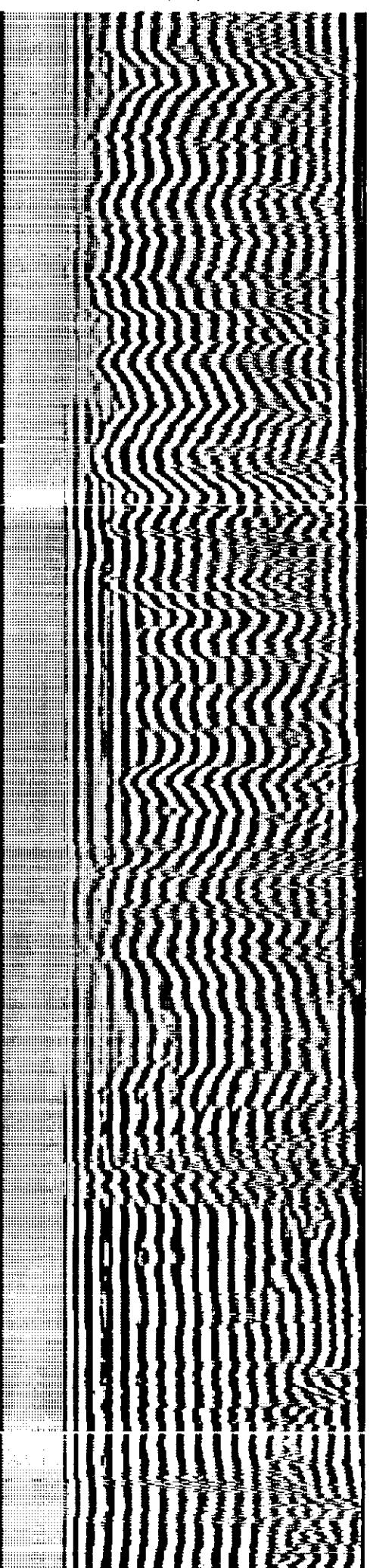
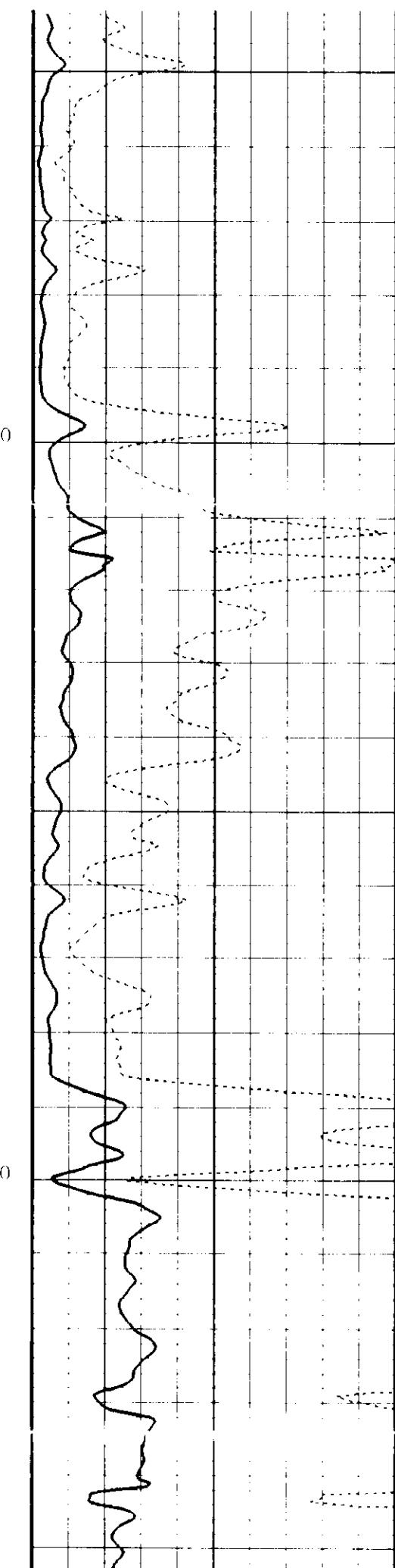
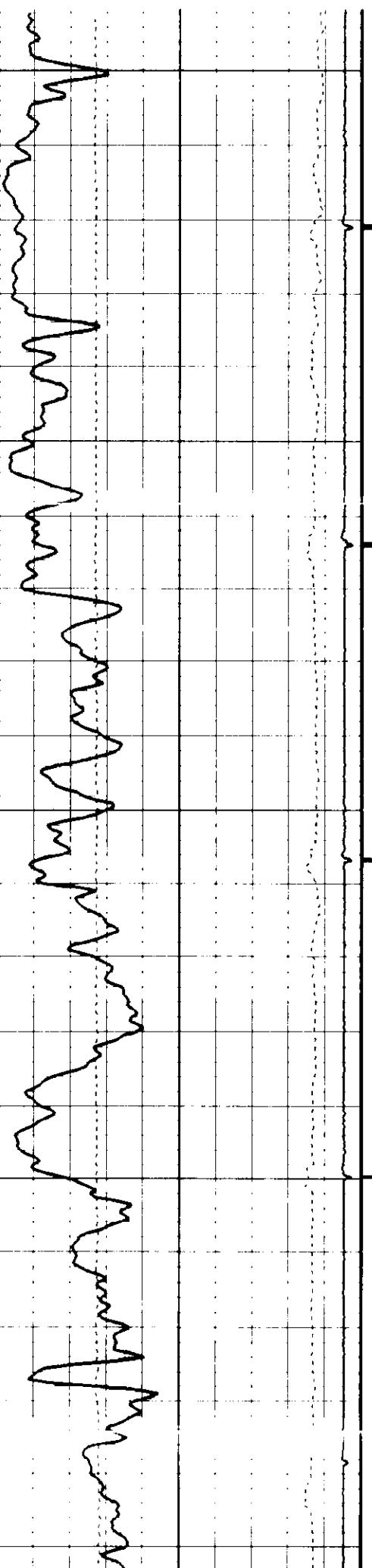
### REPEAT SECTION

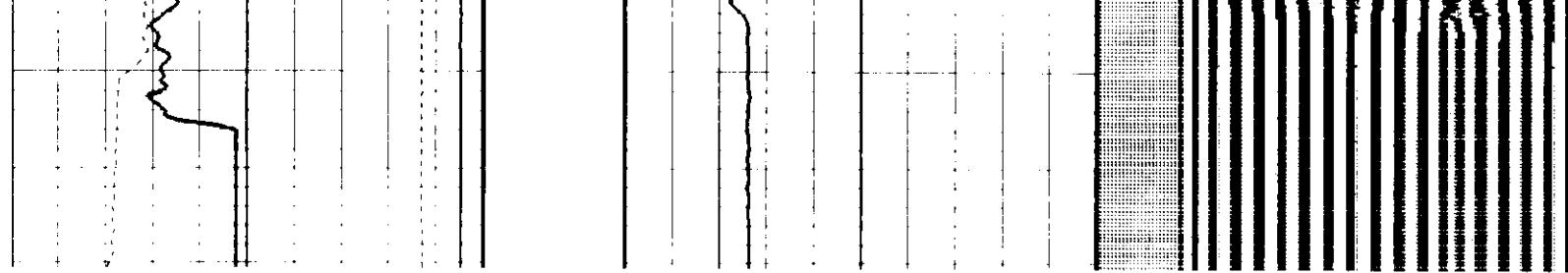
Gamma Ray (GR) 0 (GAPI)	200	CBL Amplitude (SA2) (MV)	100	Min	Amplitude	Max
Casing Collar Locator (CCL) -19 (----)	1					
Transit Time 2 (TT2) 430 (US)	230	Good Bond (GOBO) (MV)	10			
Tension (TENS) 0 (LBF)	4000	CBL Amplitude (SA2) (MV)	20	200	VDL VariableDensity (VDL) (US)	1200

200

(US)

1200





Tension (TENS)	(LBF)	4000	CBL Amplitude (SA2)	(MV)	20	VDL Variable Density (VDL)	(US)	1200
Transit Time 2 (TT2)	(US)	230	Good Bond (GOBO)	(MV)	10			
Casing Collar Locator (CCL)	(---)	1	CBL Amplitude (SA2)	(MV)	100			
Gamma Ray (GR)	(GAPI)	200						

CasCollar  
From CCL to CCL

#### PIP SUMMARY

##### └ Casing Collars

#### Parameters

DLIS Name	Description	Value
CCLD	CCL reset delay	12 IN
CCLT	CCL detection level	0.3 V
GOBO	Good Bond	2 MV

Format: CBL\_VDL Vertical Scale: 5" per 100'

Graphics File Created: 07-Nov-1996 11:24

#### OP System Version: 8B0-538

MCM

SLT-J	8B0-538	SGT-G	8B0-538
CCL-AJ	8B0-538		

#### Output DLIS Files

DEFAULT SLTJ .004 FN:3 FIELD 07-Nov-1996 11:24

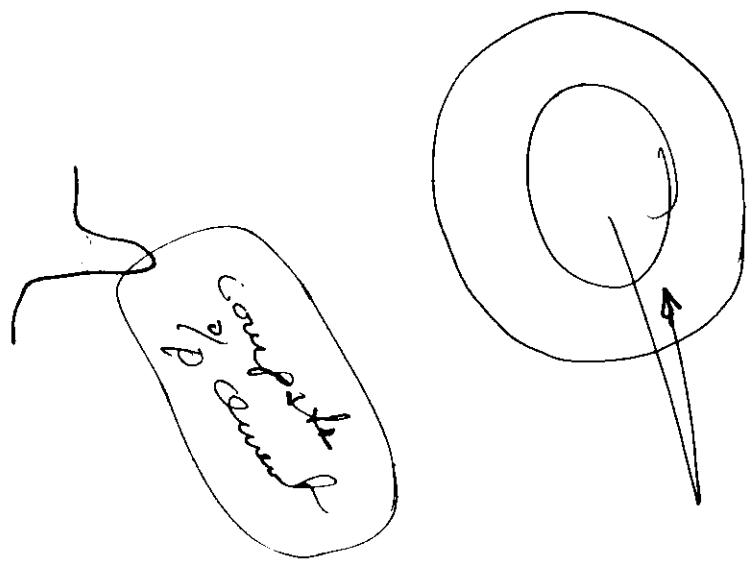
COMPANY: PETROGLYPH OPERATING CO

WELL: UTE TRIBAL # 03-04  
FIELD: ANTELOPE CREEK  
COUNTY: DUCHESNE  
STATE: UTAH

BOTTOM LOG INTERVAL	GAPI F
SUB-COLLAR INTERVAL	GAPI F
DEPTH 04.144	GAPI F
Keck's Bottom 14.1	GAPI F
Depth 14.14	GAPI F
Open Top 14.14	GAPI F

#### CEMENT BOND LOG

Schlumberger



**ATTACHMENT NO. 8**

**OPEN HOLE LOG FOR THE UIC WELL**

## COMPANY PETROGLYPH OPERATING

COMPANY, INC.

UTE TRIBAL #03-04

FIELD

## ANTELOPE CREEK

COUNTY DUCHESE STATE UTAH

**Schlumberger**  
**COMPENSATED NEUTRON**  
**LITHO-DENSITY**  
**GAMMA RAY**

Field: ANTELOPE CREEK  
 Location: 360' FNL & 460' FWL  
 Well: UTE TRIBAL #03-04  
 Company: PETROGLYPH OPERATING

LOCATION			
360' FNL & 460' FWL	LOT 4	Elev.:	K.B. 5901.9 F
NENE		G.L.	5891.9 F
Permanent Datum:	GROUND LEVEL	Elev.:	5891.9 F
Log Measured From:	KELLY BUSHING	D.F.	5900.9 F
Drilling Measured From:	KELLY BUSHING		
API Serial No.	43-013-31736	SECTION	3
		TOWNSHIP	5S
		RANGE	3W
Logging Date	31-OCT-1996		
Run Number	ONE		
Depth Driller	6524 F		
Schlumberger Depth	6522 F		
Bottom Log Interval	6504 F		
Top Log Interval	428 F		
Casing Driller Size @ Depth	8.625 IN	@	427 F
Casing Schlumberger	428 F		
Bit Size	7.875 IN		
Type Fluid In Hole	AMMONIUM CHLORIDE		
Density	8.6 LB/G	28 S	
Fluid Loss	PH	10.2	
Source Of Sample	FLOW LINE		
RM @ Measured Temperature	2.370 OHMM	@	49 DEGF
RMF @ Measured Temperature	2.370 OHMM	@	49 DEGF
RMC @ Measured Temperature	CALCULATED	@	
Source RMF	RMC		
RM @ MRT	RMF @ MRT	0.907 @ 139	0.907 @ 139
Maximum Recorded Temperatures	139 DEGF		
Circulation Stopped	Time	31-OCT-1996	11:30
Logger On Bottom	Time	31-OCT-1996	18:30
Unit Number	Location	2018	VERNAL, UTAH
Recorded By		A. WHITE	
Witnessed By		MR. KENT STRINGHAM	

~~CONFIDENTIAL~~

			Run 1	Run 2	Run 3
Logging Date					
Run Number					
Depth Driller					
Schlumberger Depth					
Bottom Log Interval					
Top Log Interval					
Casing Driller Size @ Depth					
Casing Schlumberger					
Bit Size					
Type Fluid In Hole					
Density					
Fluid Loss					
Source Of Sample					
RM @ Measured Temperature					
RMF @ Measured Temperature					
RMC @ Measured Temperature					
Source RMF					
RM @ MRT					
RMF @ MRT					
Maximum Recorded Temperatures					
Circulation Stopped					
Logger On Bottom					
Unit Number					
Recorded By					
Witnessed By					

ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS AND WE CANNOT, AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATIONS, AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFUL NEGLIGENCE ON OUR PART, BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COSTS, DAMAGES OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO CLAUSE 4 OF OUR GENERAL TERMS AND CONDITIONS AS SET OUT IN OUR CURRENT PRICE SCHEDULE.

OTHER SERVICES1 OS1: AITH/GR OS2: OS3: OS4: OS5:	OTHER SERVICES2 OS1: OS2: OS3: OS4: OS5:				
REMARKS: RUN NUMBER 1 BOWSPRING RUN ON NEUTRON TOOL GAS KICKS DROPPED FLUID LEVEL TO 2356 - NOTE NEUTRON RESPONSE SANDSTONE MATRIX 2.68 G/CC USED	REMARKS: RUN NUMBER 2				
THANKS FOR USING SCHLUMBERGER!!					
SWS CREW: J RIXEY / G BATTY					
RUN 1 SERVICE ORDER #: 670214 PROGRAM VERSION: 7C0-427 FLUID LEVEL: 2356 F	RUN 2 SERVICE ORDER #: PROGRAM VERSION: FLUID LEVEL:				
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

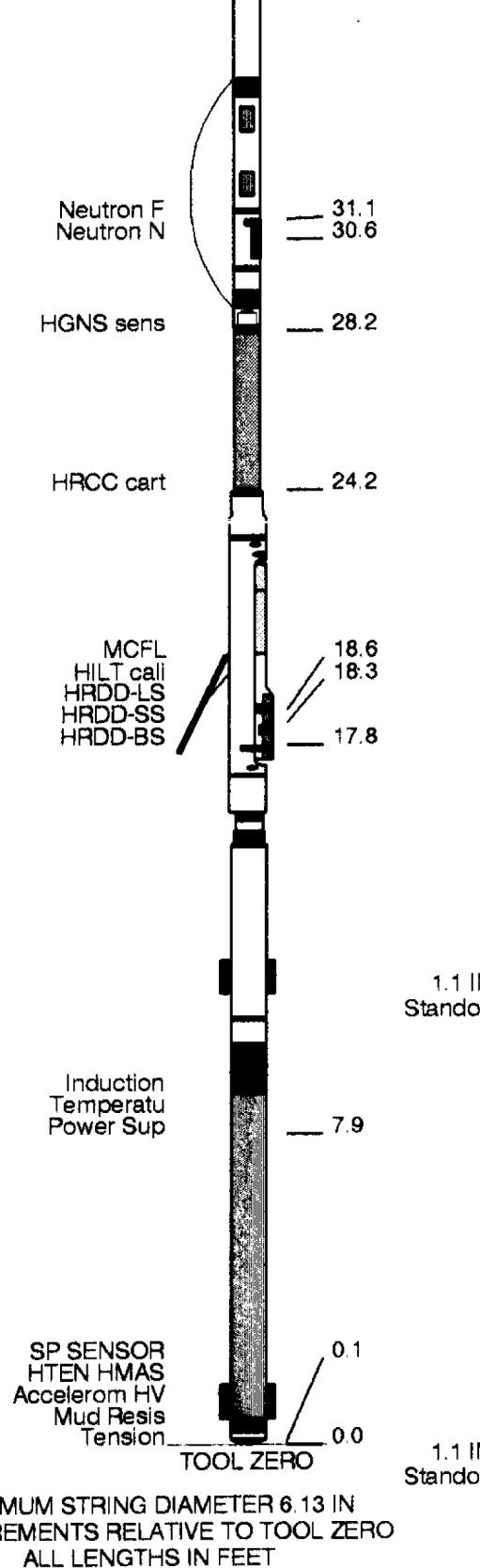
### EQUIPMENT DESCRIPTION

RUN 1

RUN 2

TCM-AB 88 GSR-U/Y NCT-B CNB-AB	SURFACE EQUIPMENT NCS-VB	
DOWNHOLE EQUIPMENT		
PEH-A PEH-A		40.8
AH-64 AH-64	HGNS HTEM HMCA TelStatus CTEM	39.0
HILT-B-CTS HGNSC-B	Gamma-Ray	37.6 36.9

HGNSC-B  
 HMCA  
 TCC-B  
 HGNS-H  
 NLS-KL  
 NSR-F 2549  
 HACZ  
 HCNT  
 HGR  
 HRCC-B 828  
 HRMS-B 830  
 HRGD 818  
 GLS-VJ 1867  
 MCFL Device  
 HILT Nucl. LS  
 HILT Nucl. SS  
 HILT Nucl. BS  
 AIT-H  
 AHIS-BA 100  
 BOW-SPR  
 NPV-N



### Output DLIS Files

DEFAULT	HILTC .004	FN:3	FIELD	31-OCT-1996 18:30
REDUCED	HILTC .004	FN:4	CUST	31-OCT-1996 18:30

### Integrated Hole/Cement Volume Summary

Hole Volume = 2179.93 F3

Cement Volume = 1173.97 F3 (assuming 5.50 IN casing O.D.)

Computed from 6524.0 FT to 427.0 FT using data channel(s) HCAL

HILTB-CTS  
HOLEVRPCVX-680  
RPCVX-680ALLRES  
PERTRPCVX-680  
RPCVX-680

## PIP SUMMARY

- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
  - └ Integrated Cement Volume Minor Pip Every 10 F3
  - └ Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

<b>MAIN PASS</b>	<b>SANDSTONE MATRIX, 2.68 G/CC</b>	<b>Tension (TENS)</b>	.....
		10000 (LBF)	0

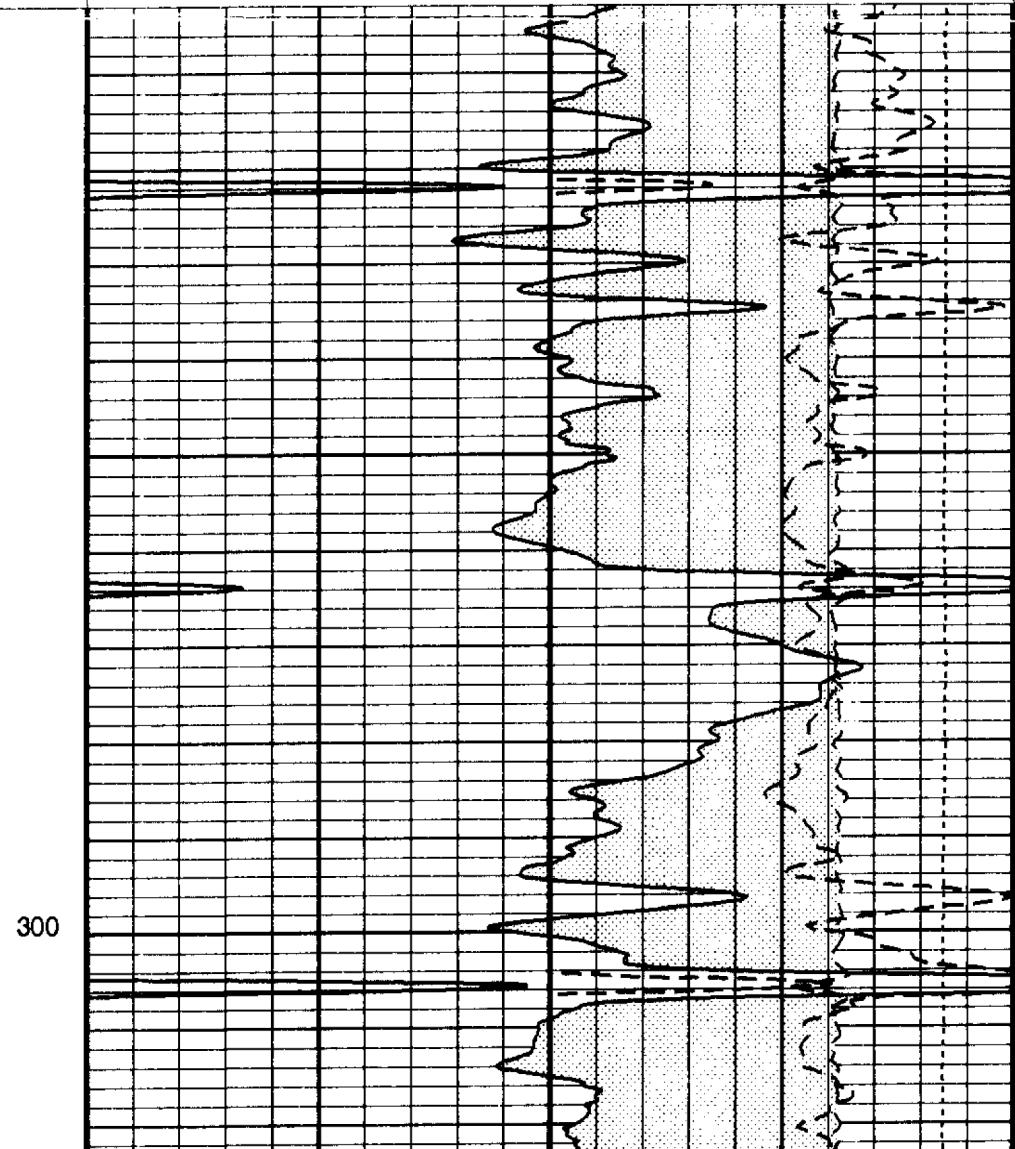
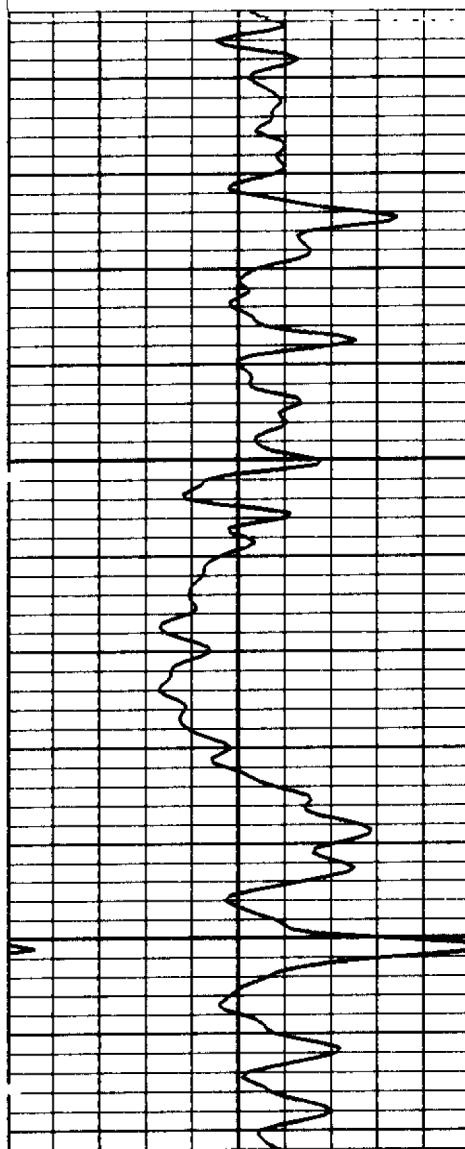
  

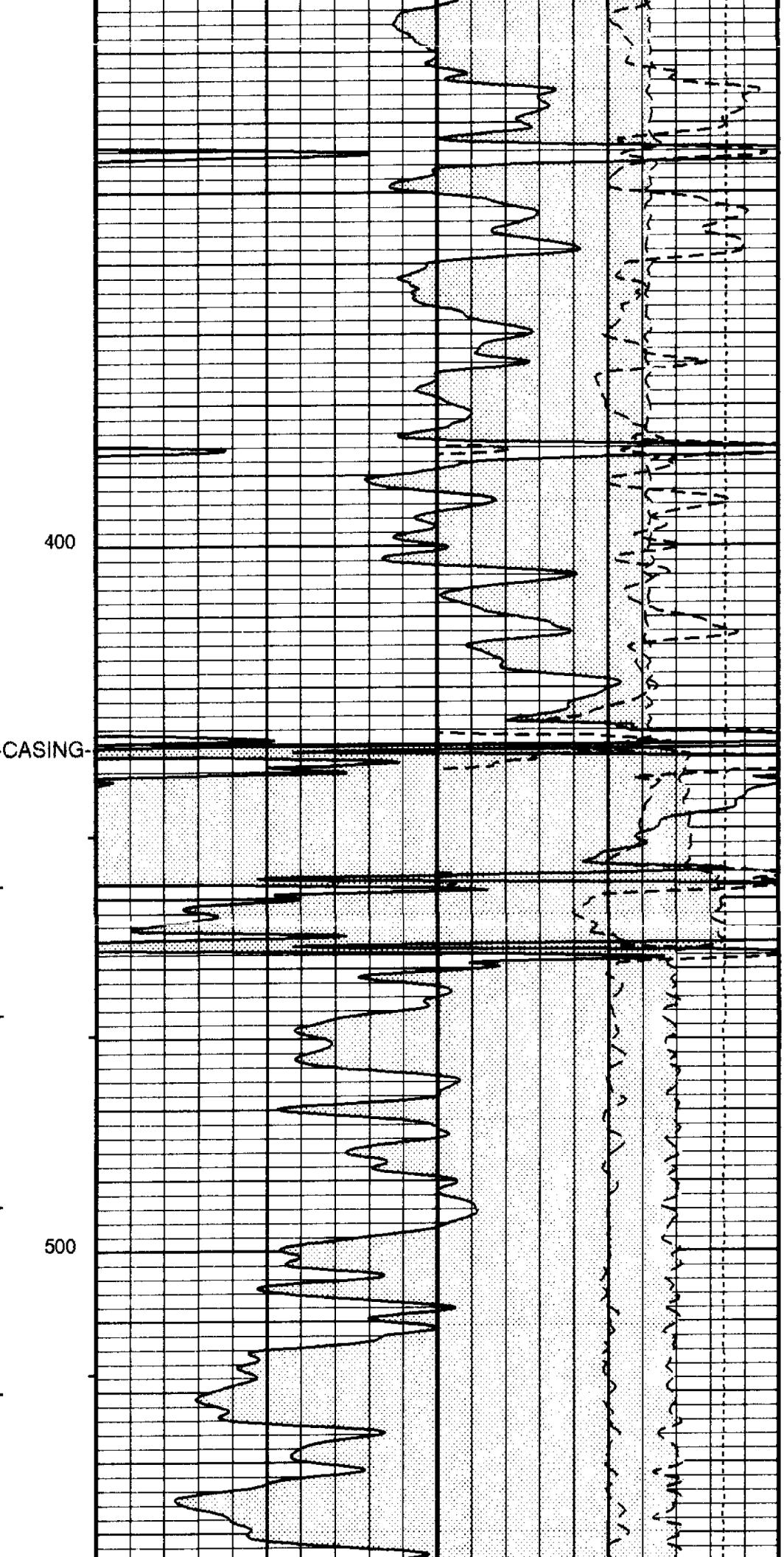
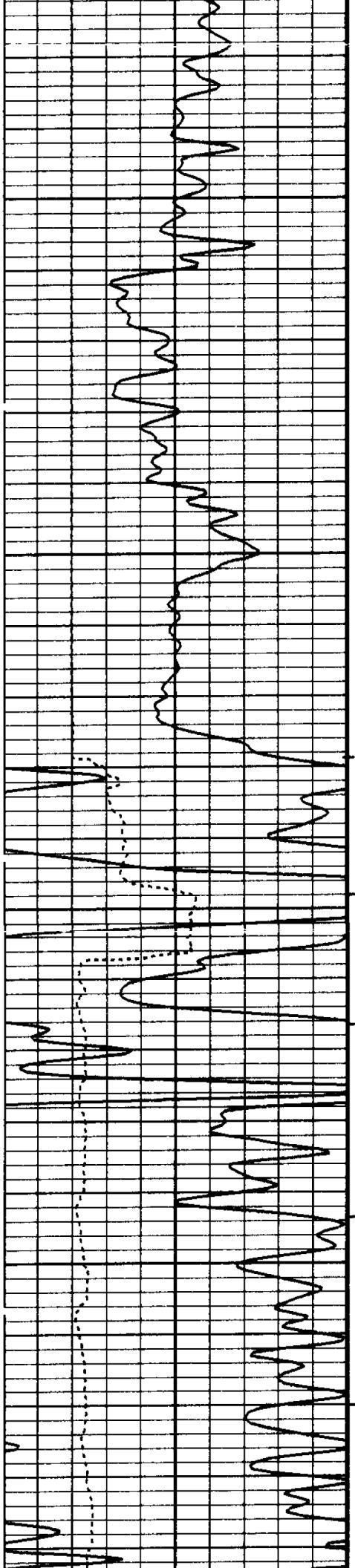
		<b>Density Correction (HDRA)</b>	.....
-0.25	(G/C3)	0.25	

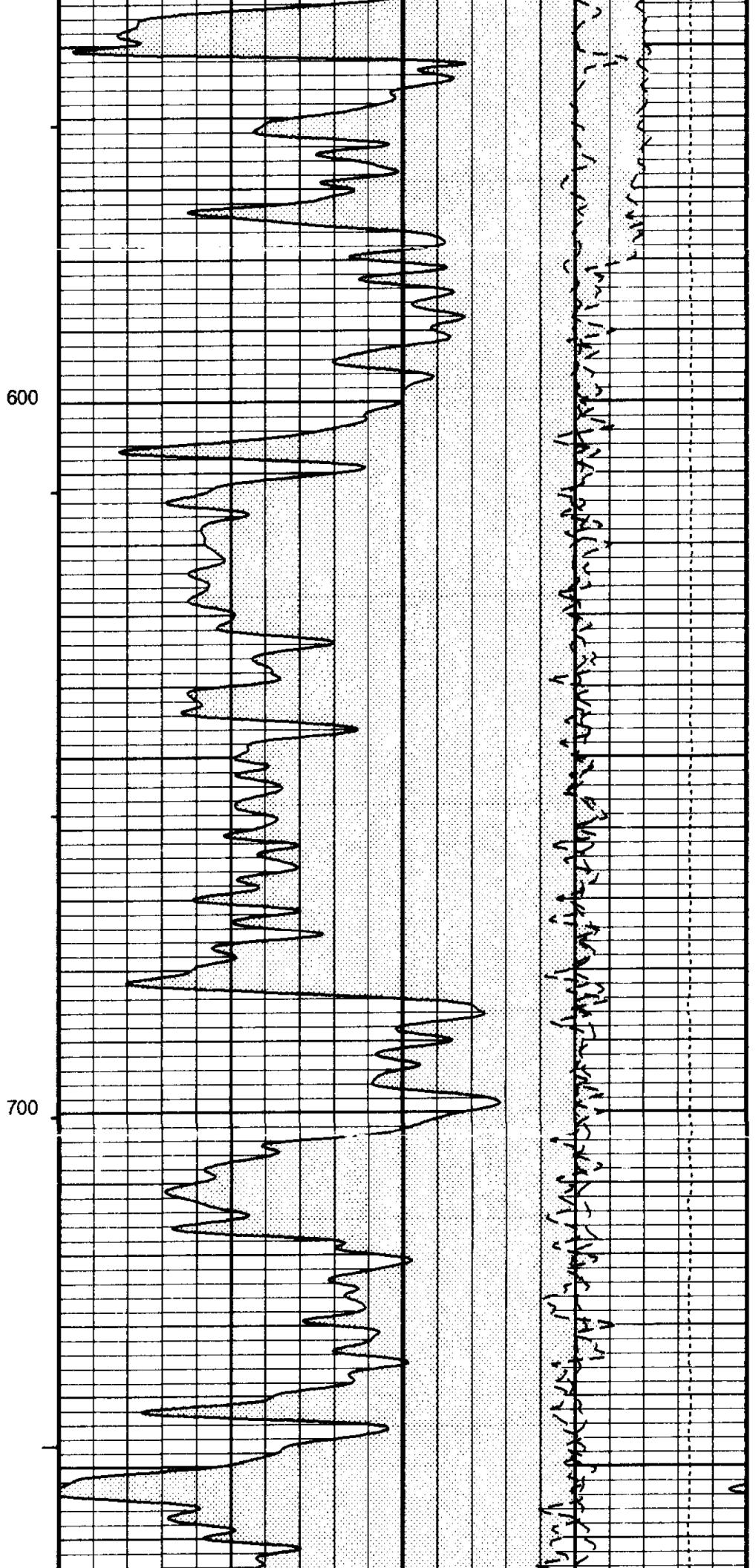
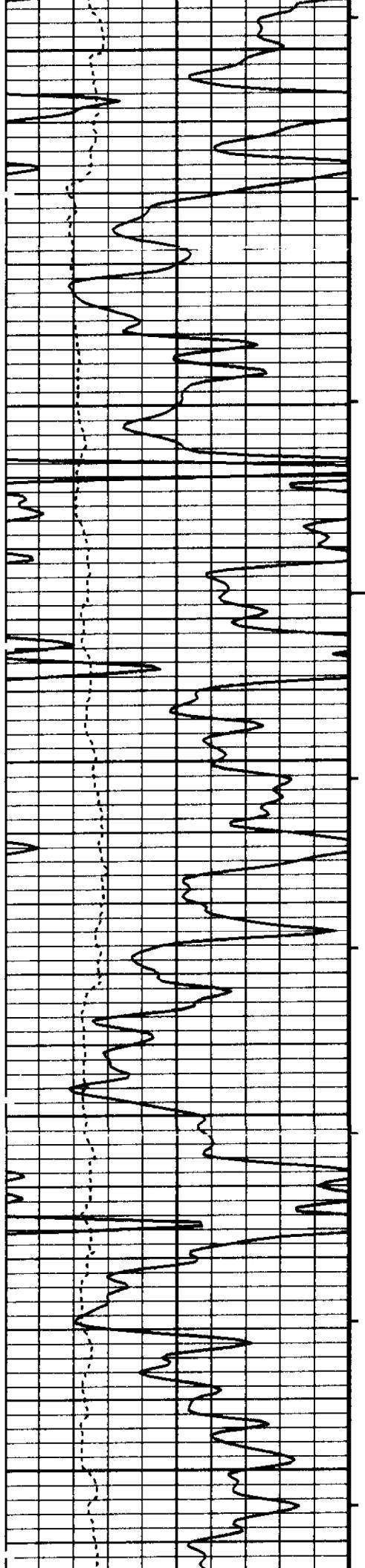
		<b>Tool/Tot. Drag From D3T to STIA</b>	<b>GAS EFFECT From DPHZ to NPOR</b>		
<b>Caliper (HCAL)</b>	<b>Cable Drag From STIA to STIT</b>	0.3	<b>Alpha Processed Neutron Porosity (NPOR)</b>	<b>(V/V)</b>	-0.1
6 (IN)	16				

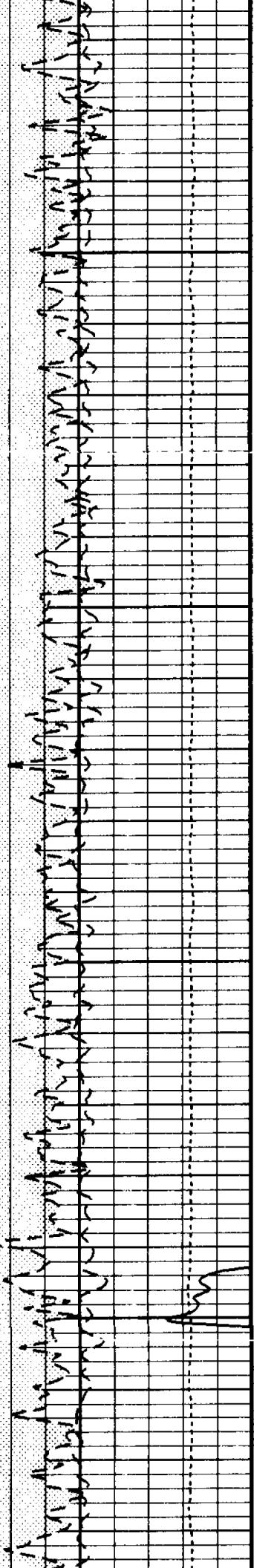
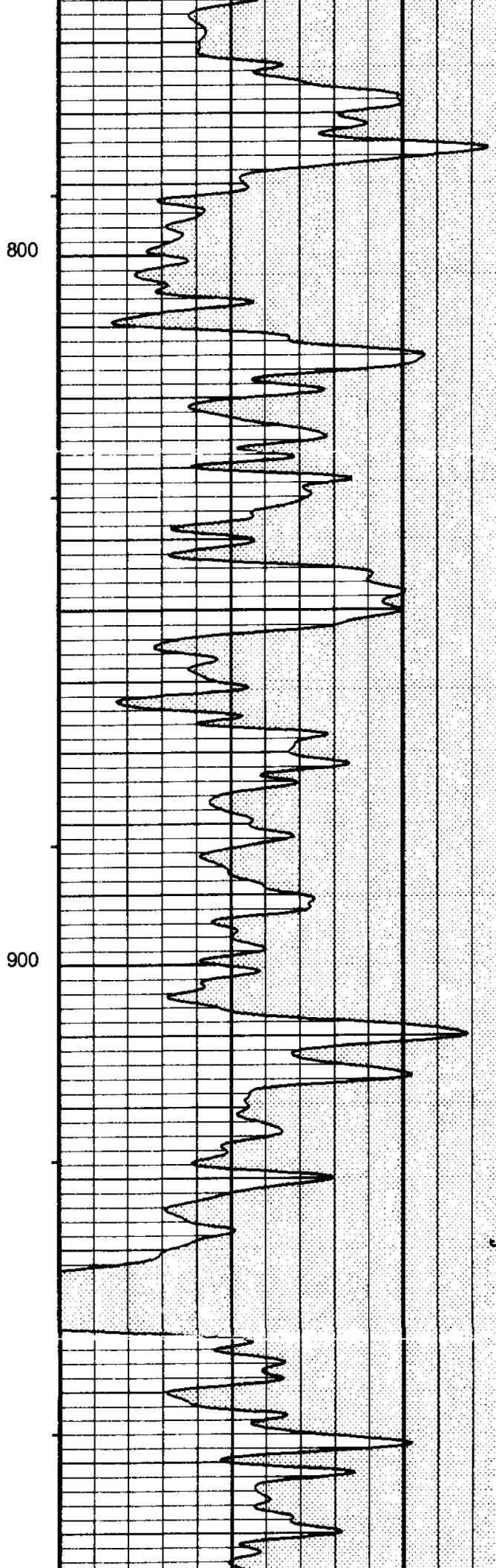
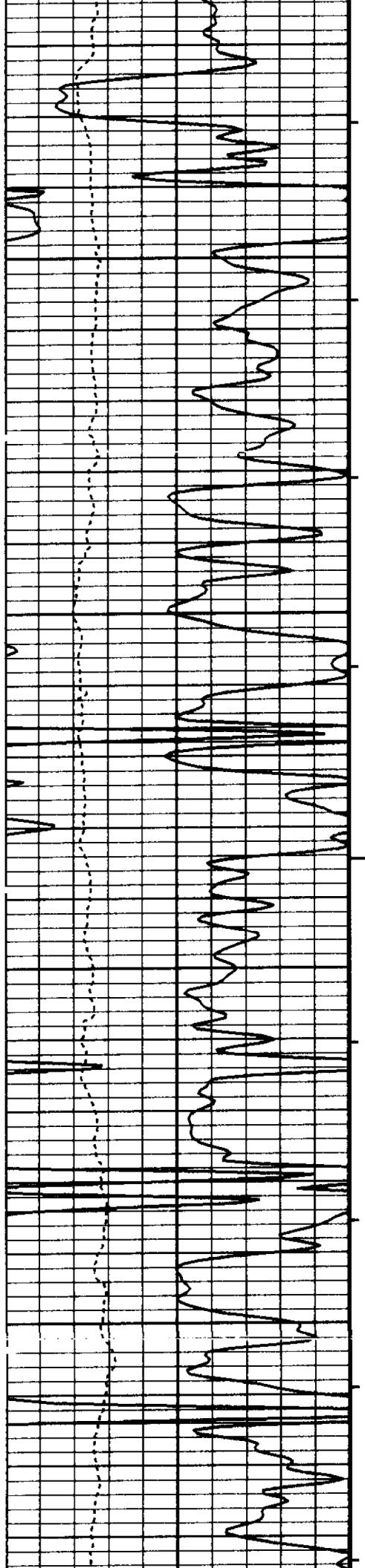
  

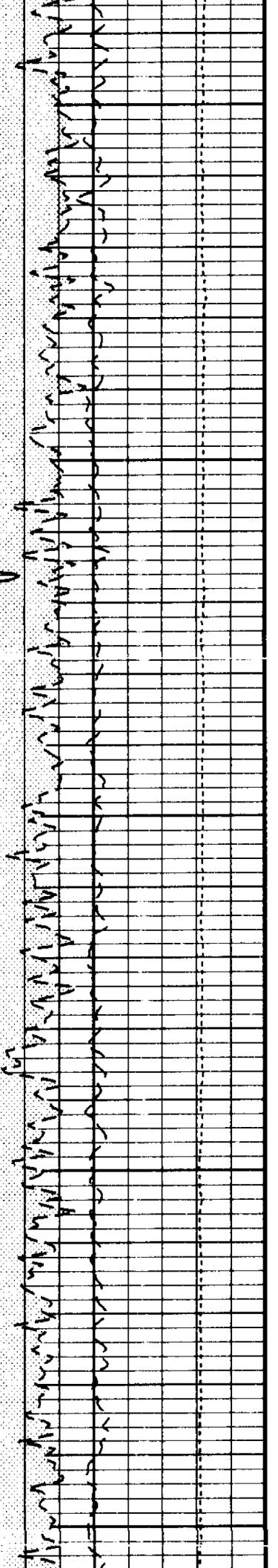
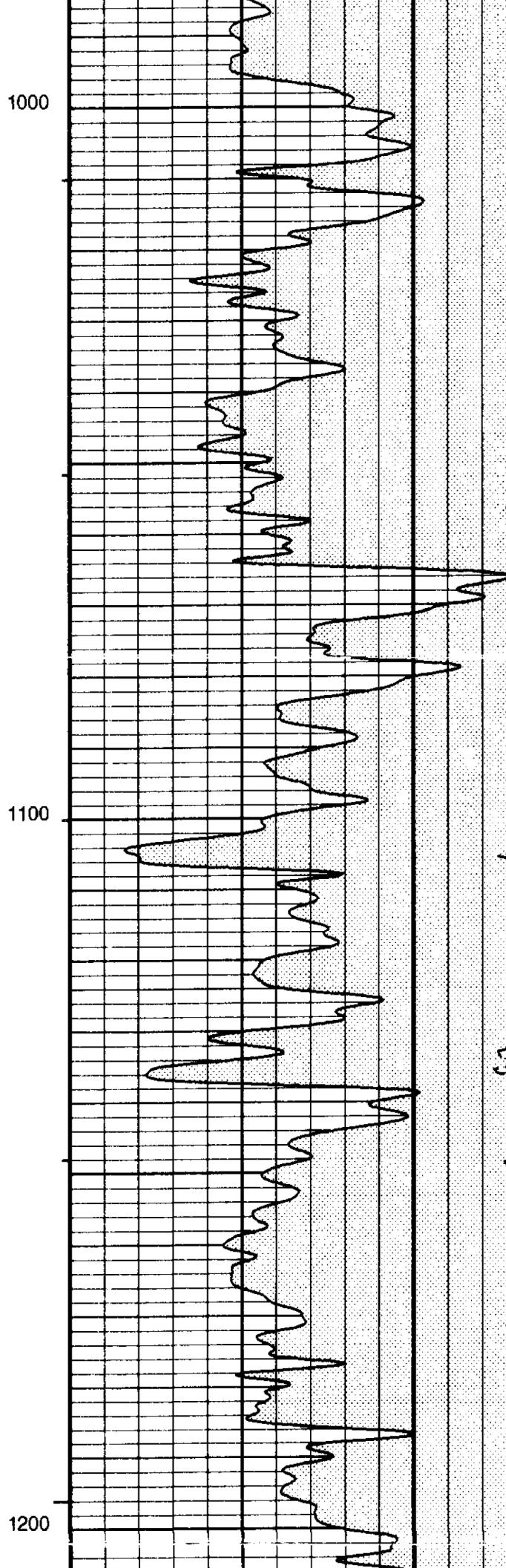
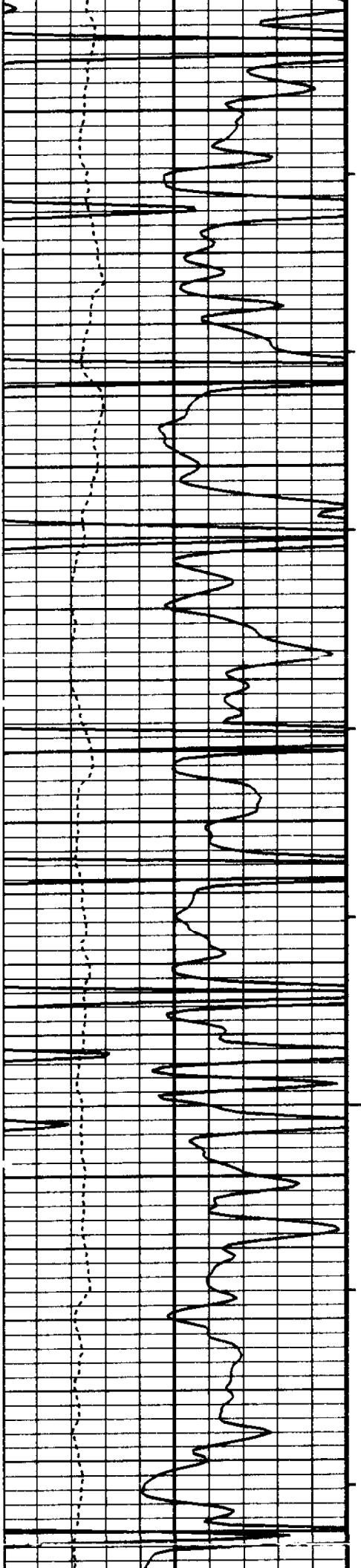
		<b>Stuck Stretch (STIT)</b>	<b>Std. Res. Density Porosity (DPHZ)</b>		
<b>Gamma Ray (GR)</b>	<b>0 (GAPI)</b>	0.3	<b>(V/V)</b>		-0.1
200	0 (F) 50				

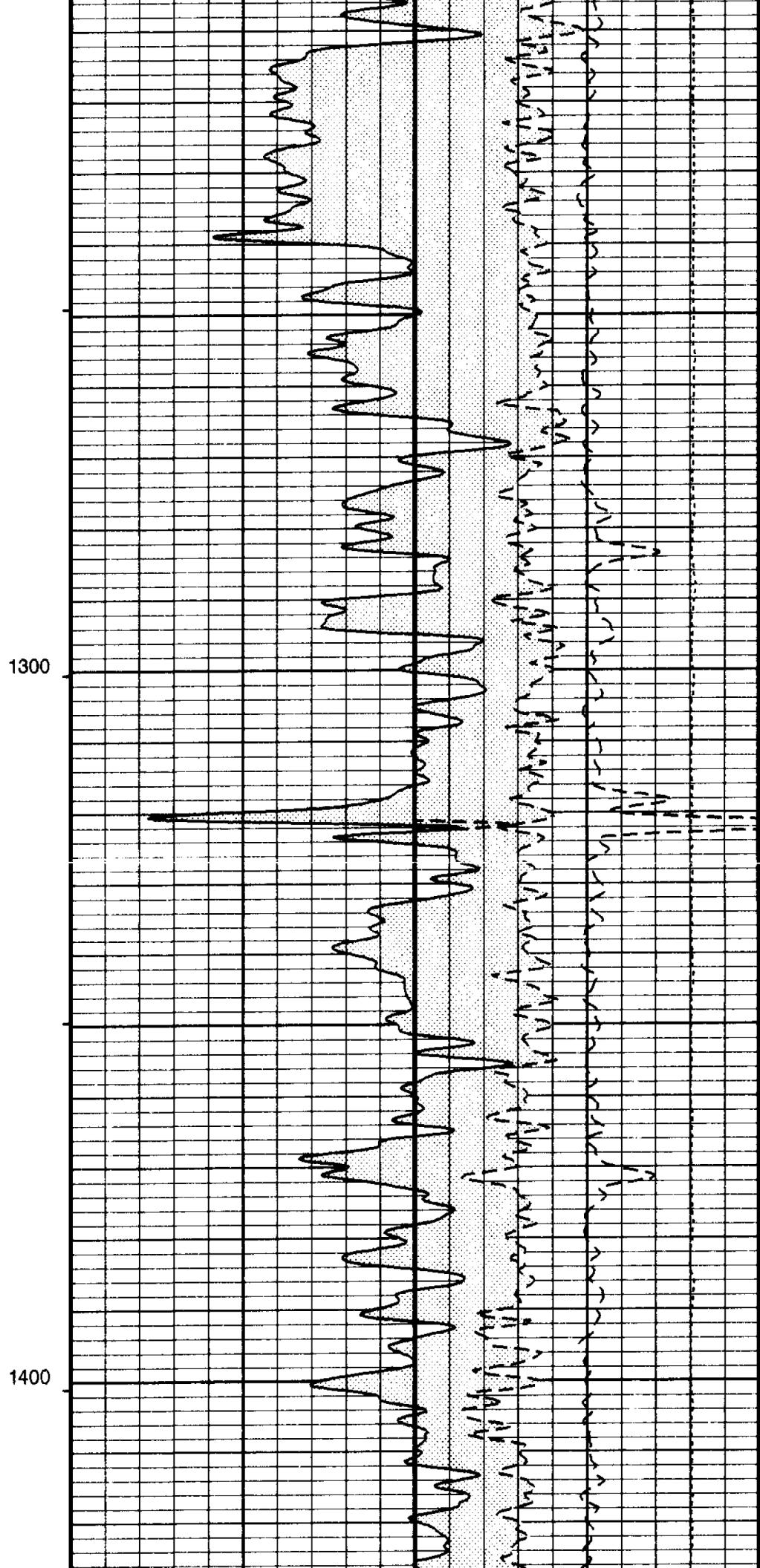
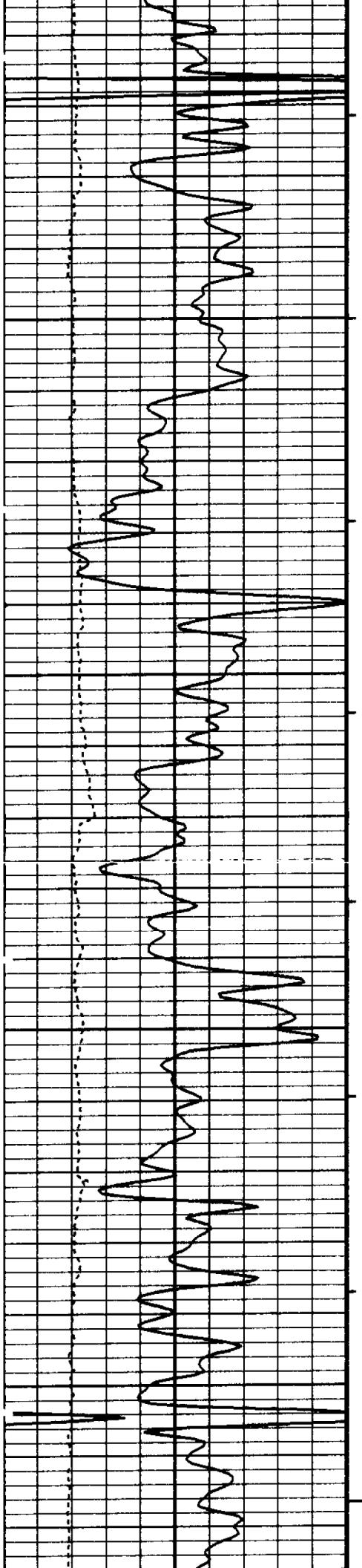


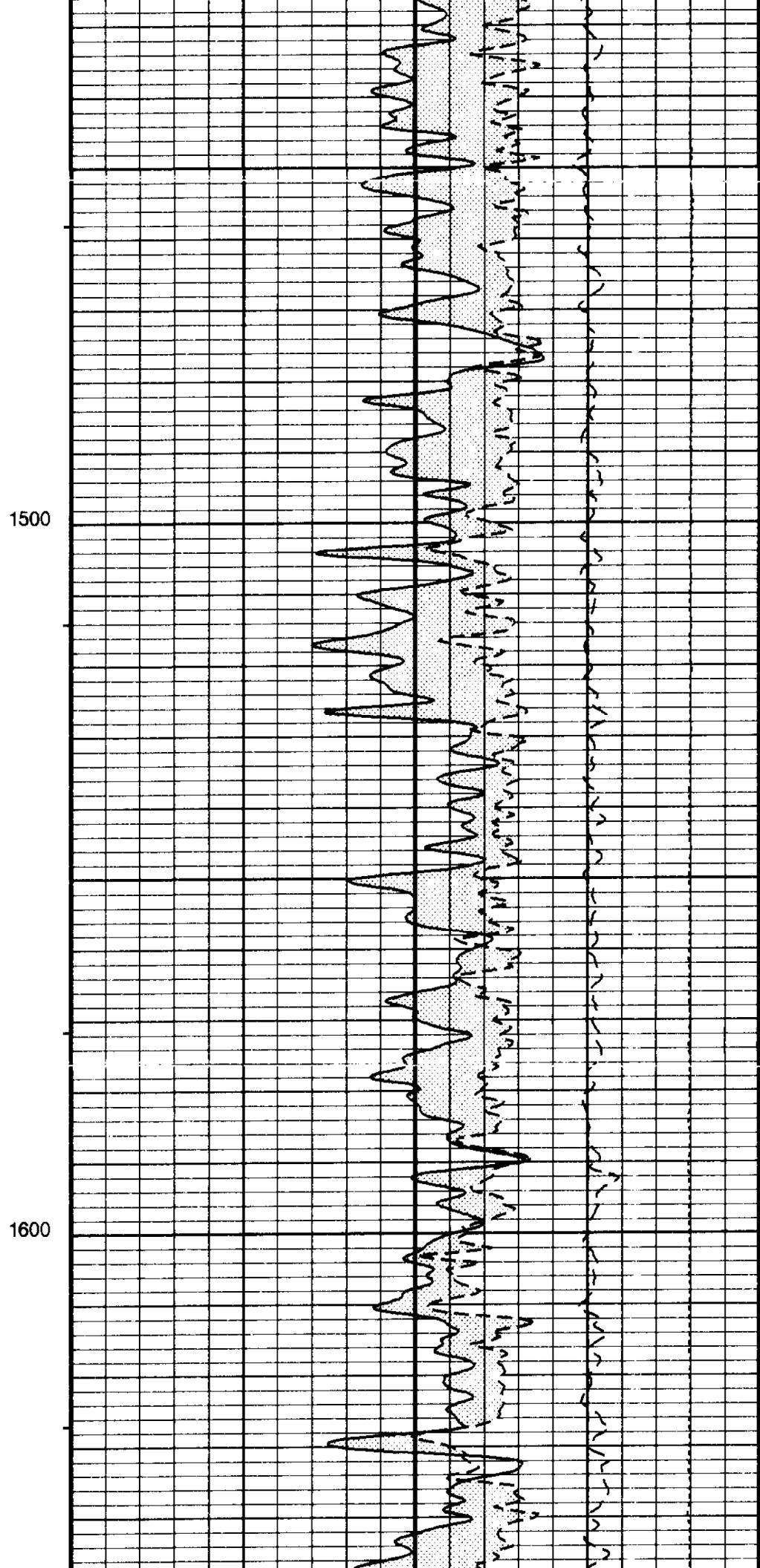
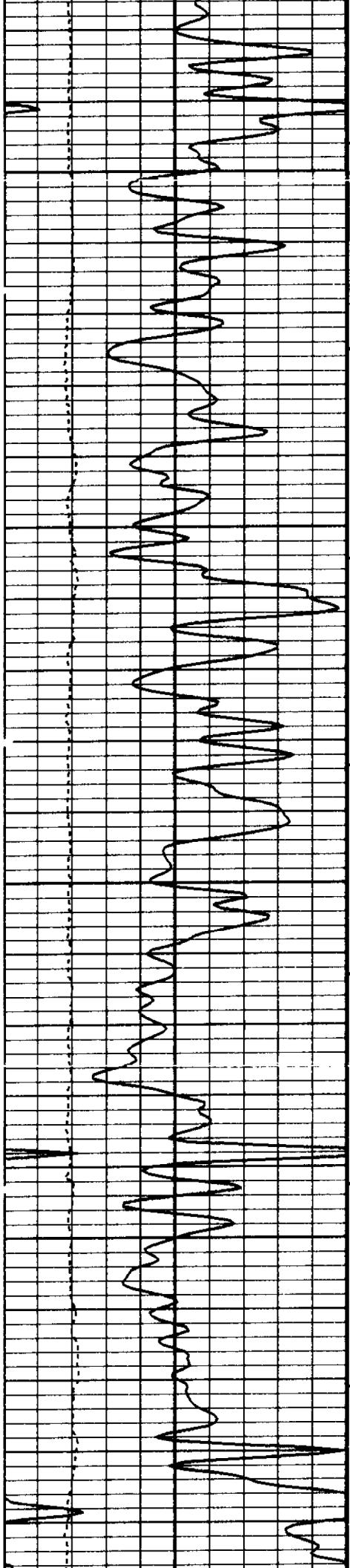


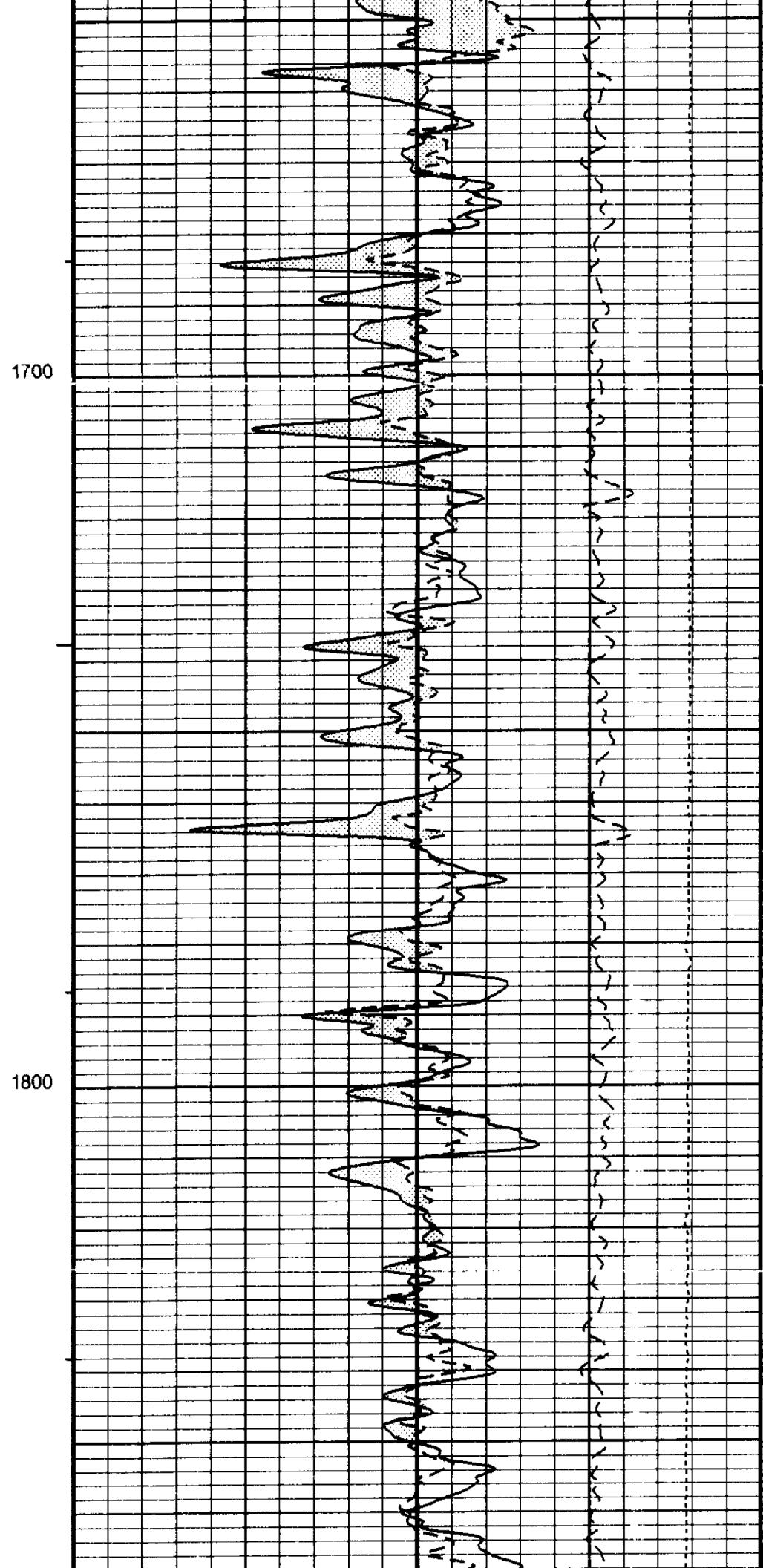
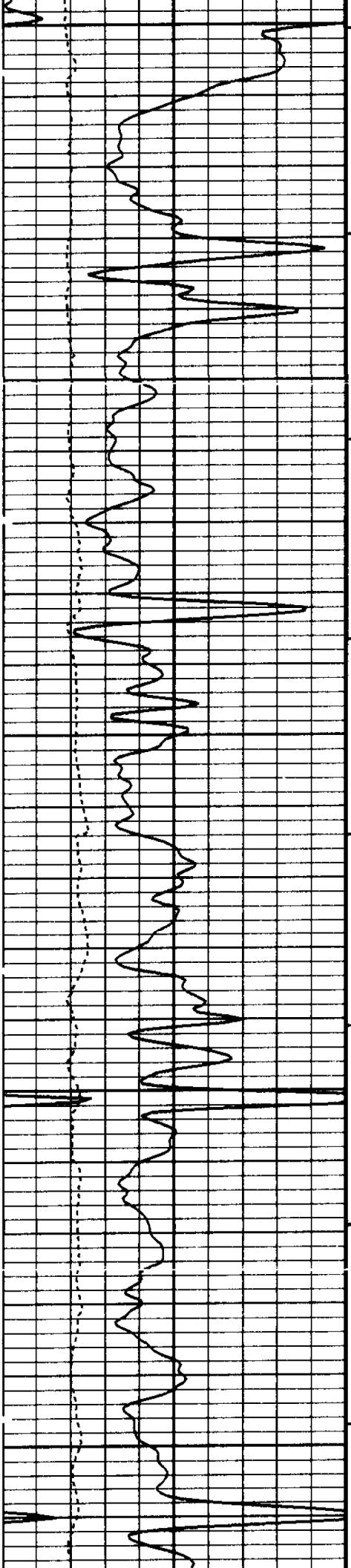


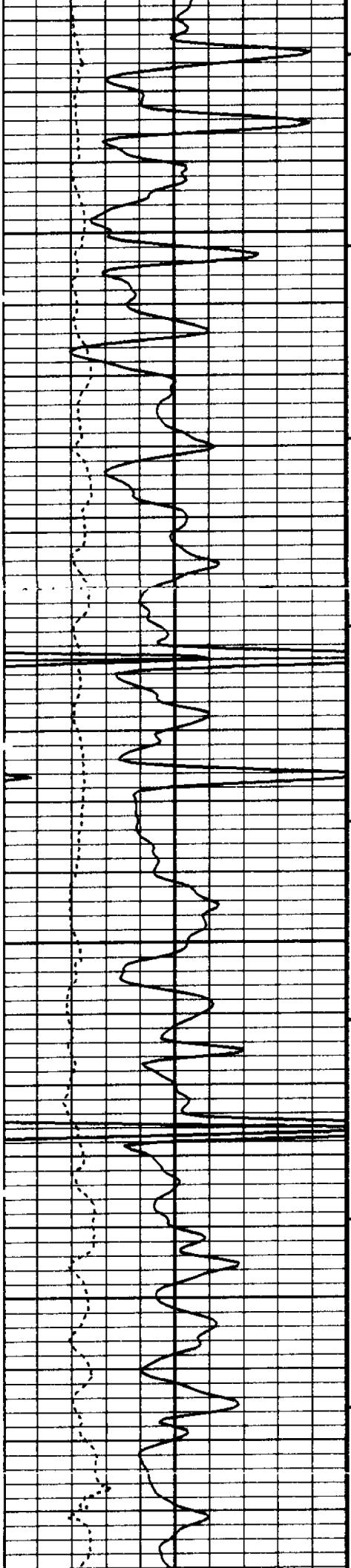






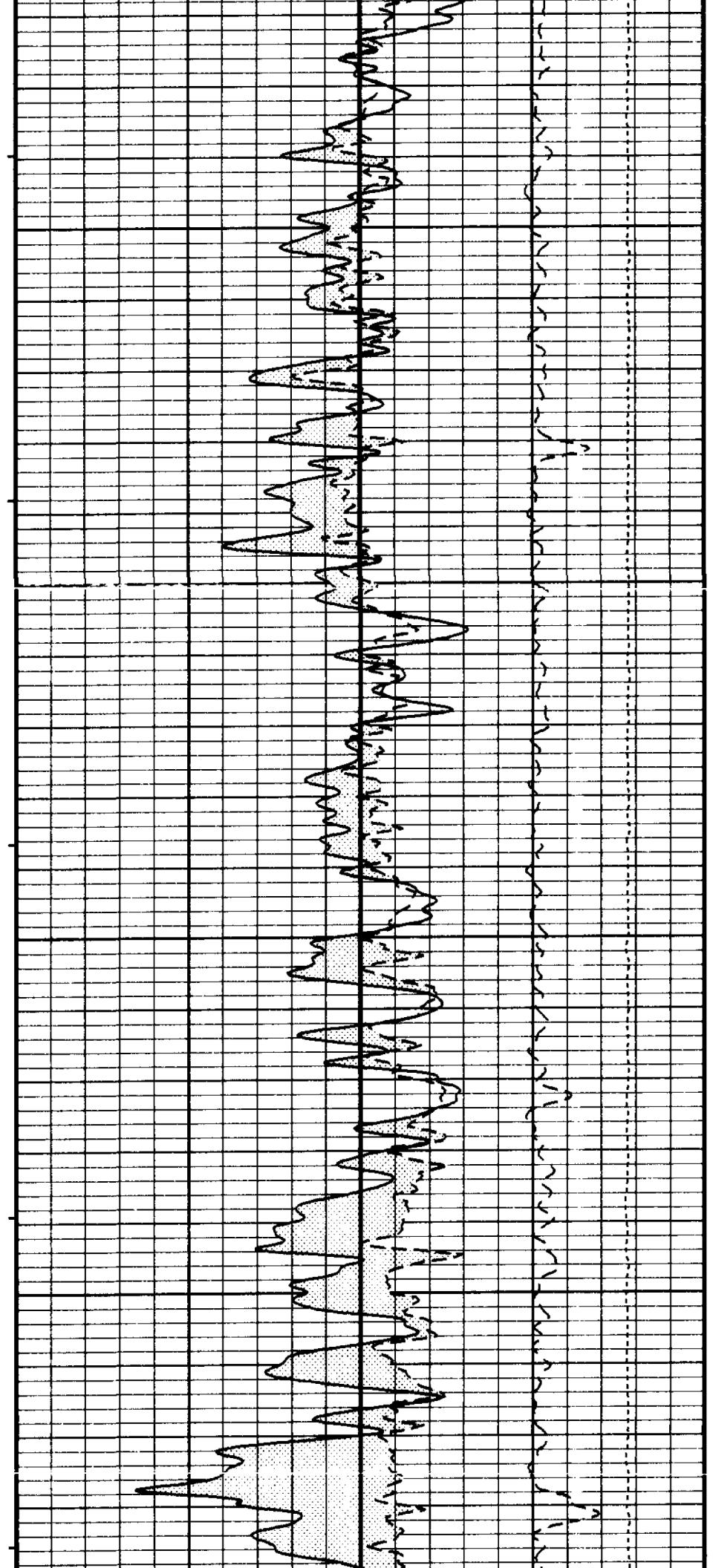


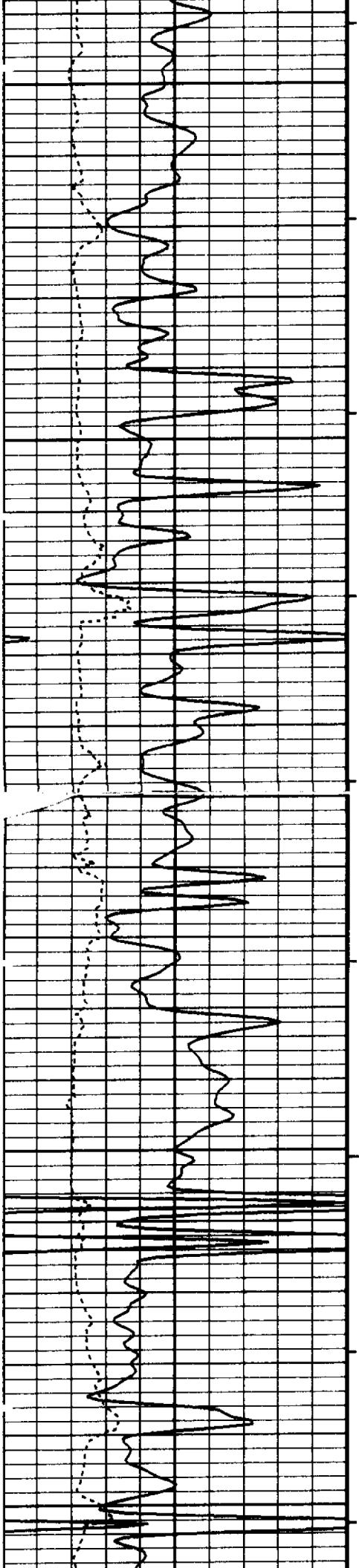




1900

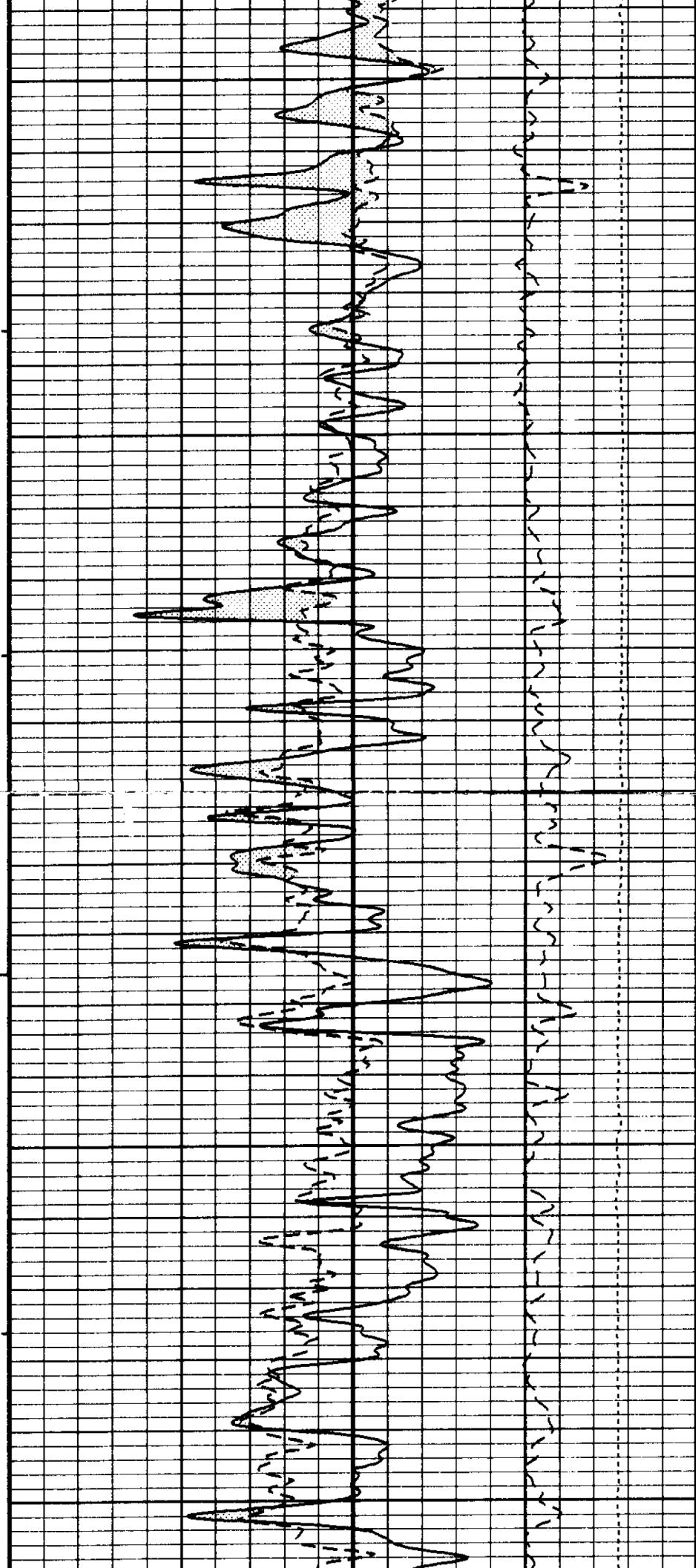
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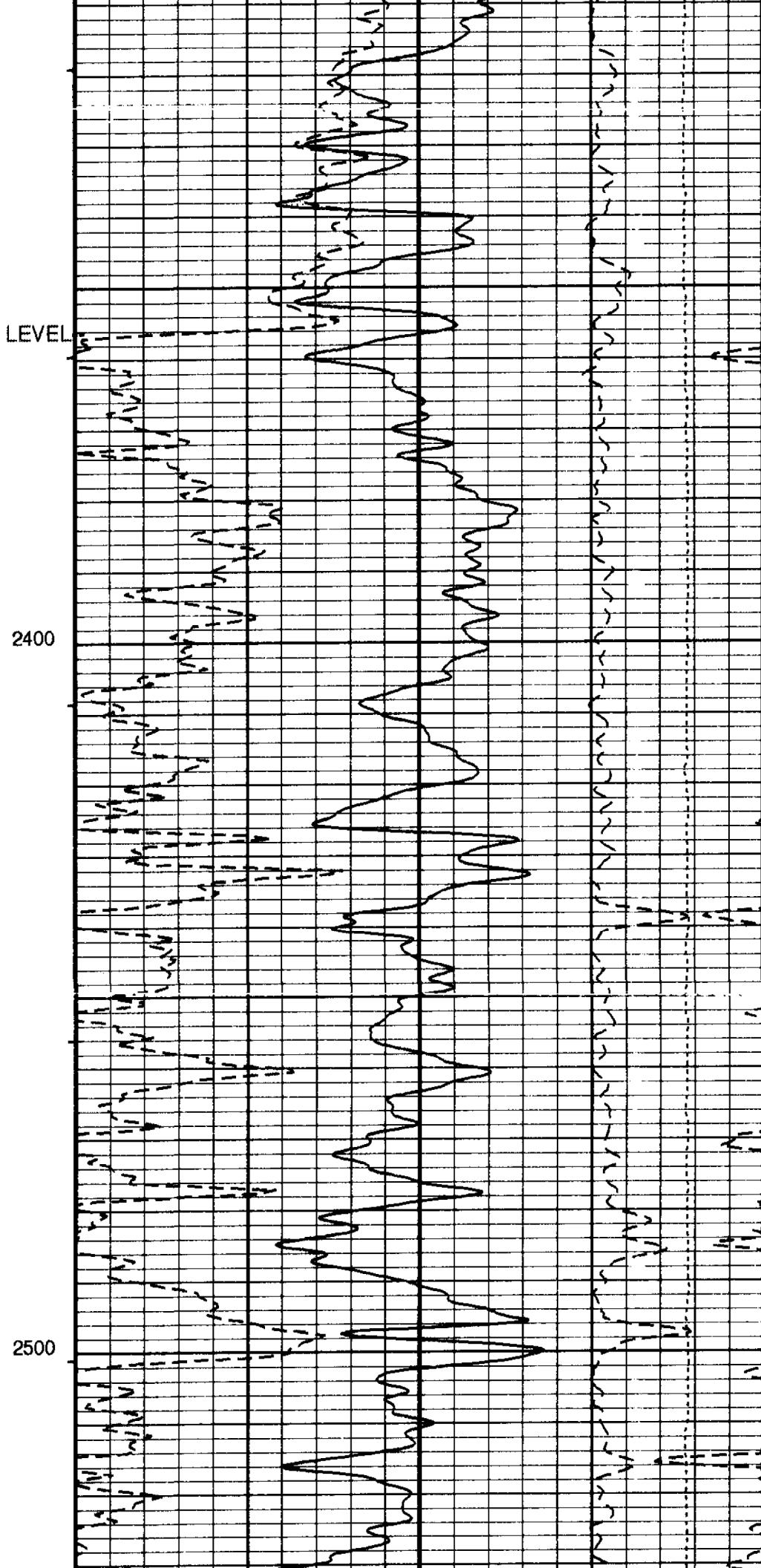
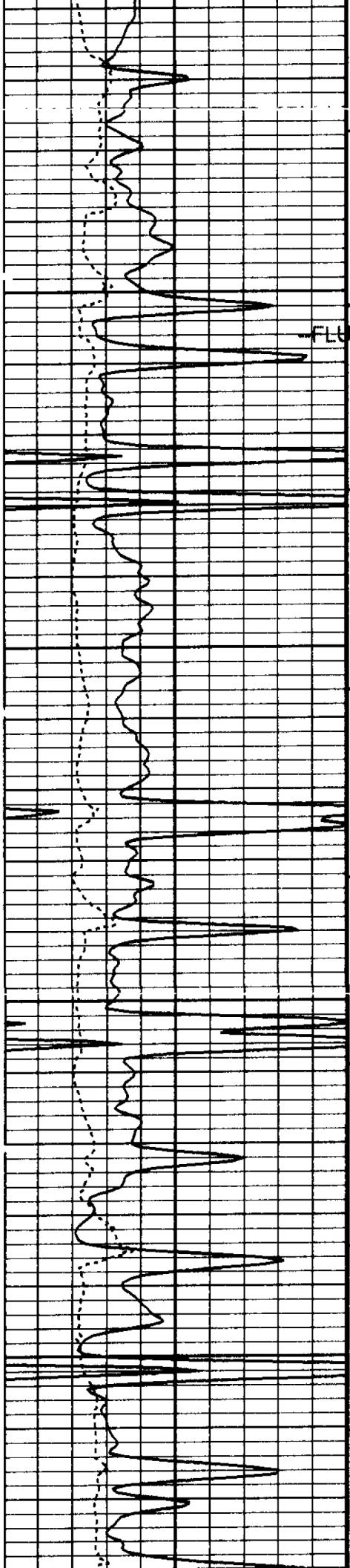


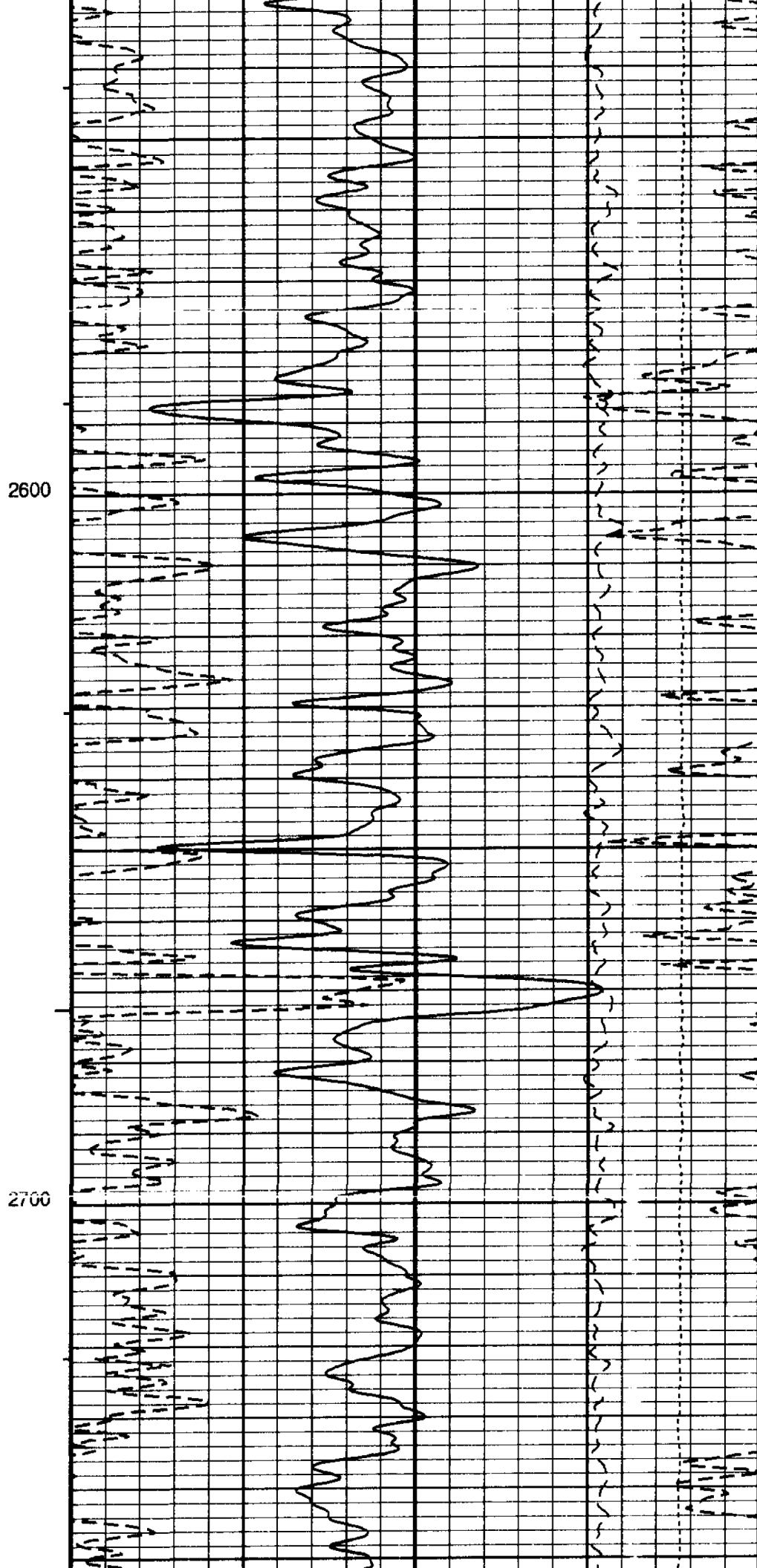
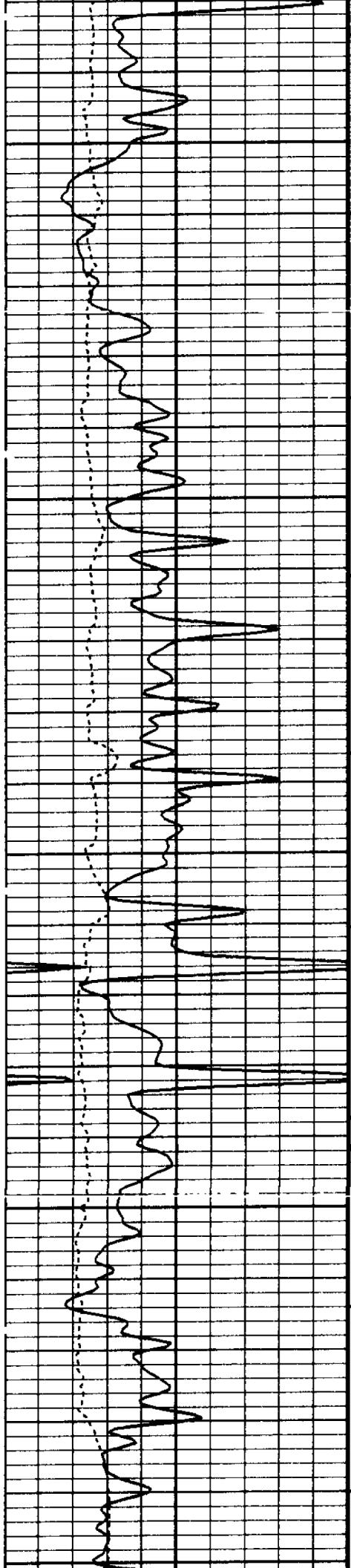


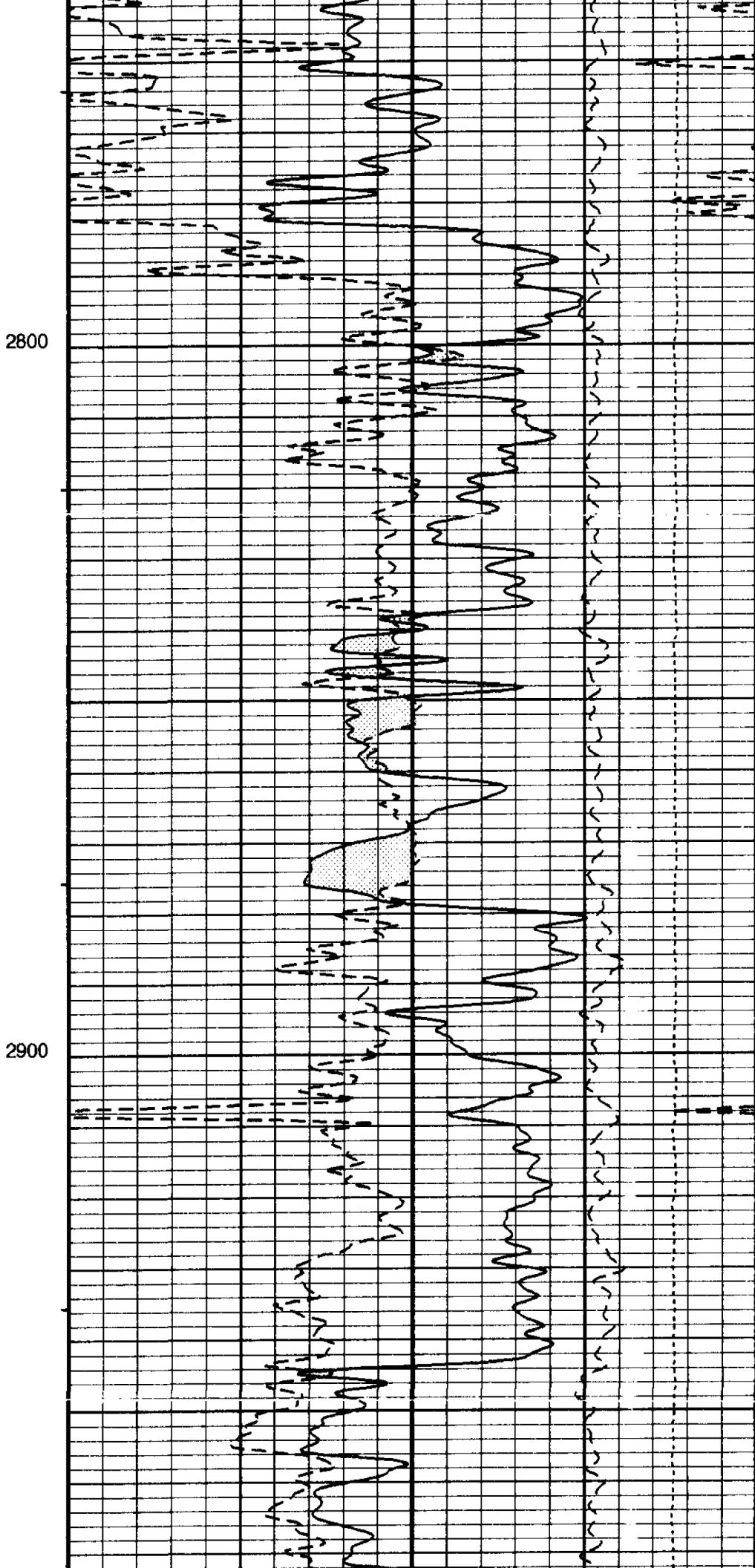
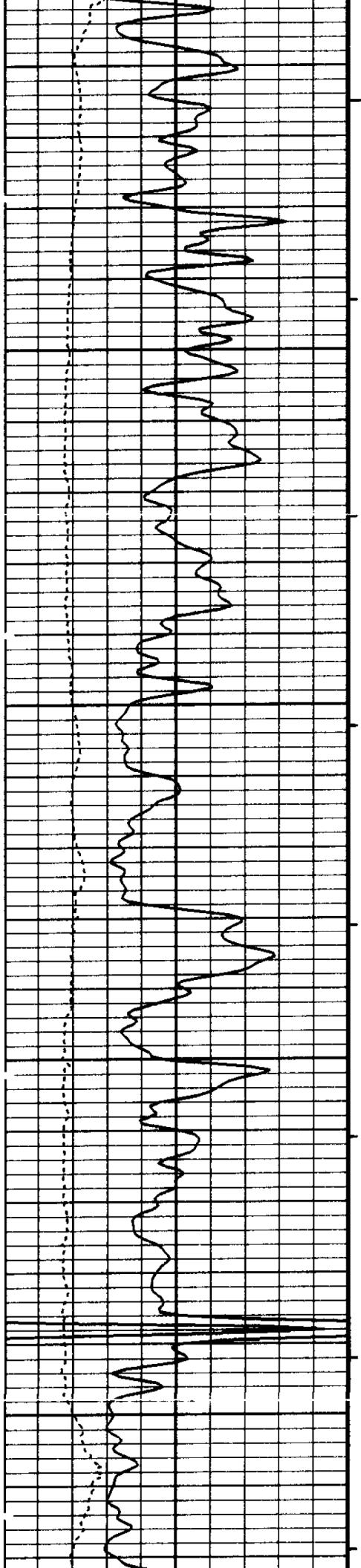
2100  
2200

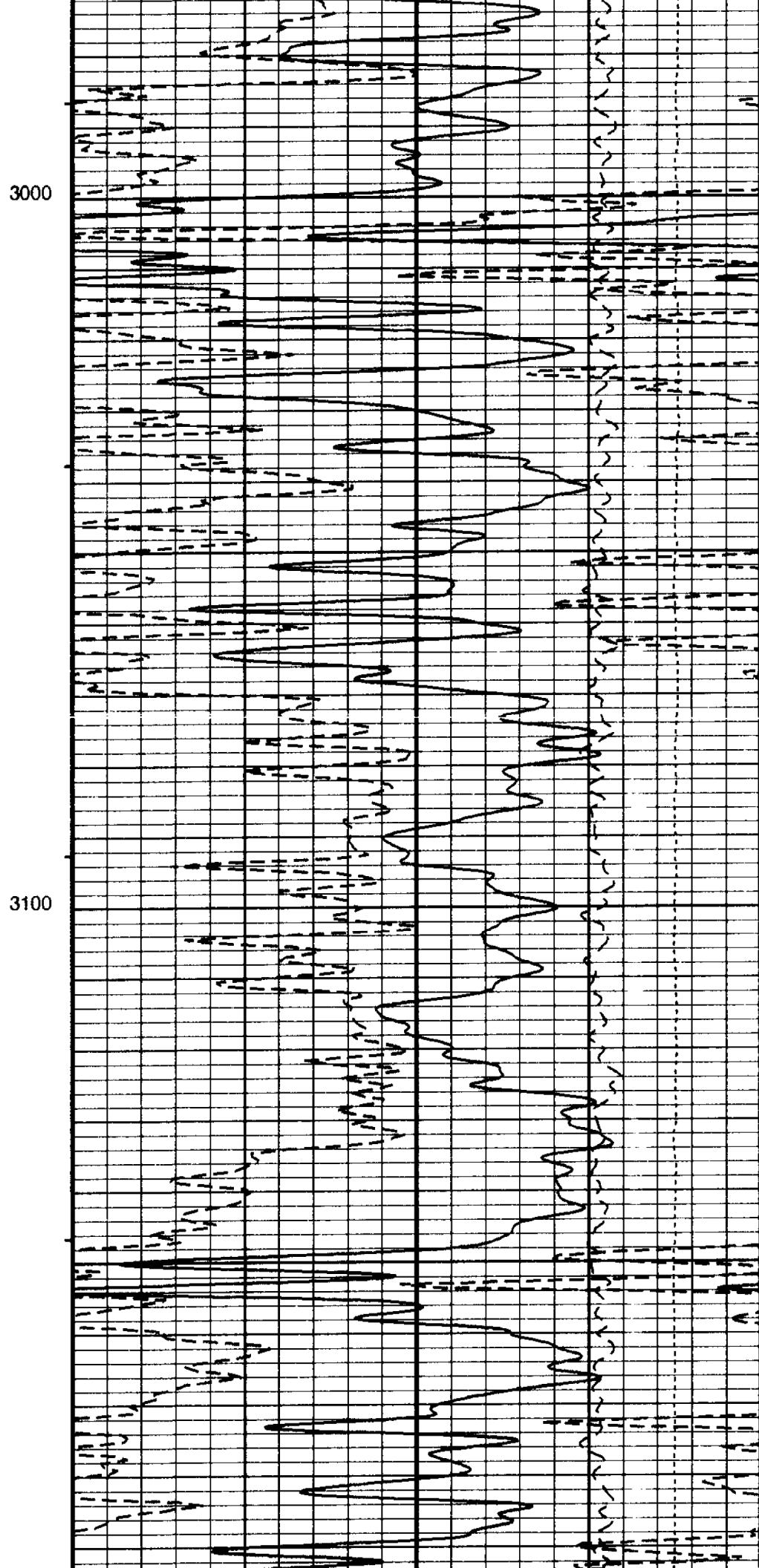
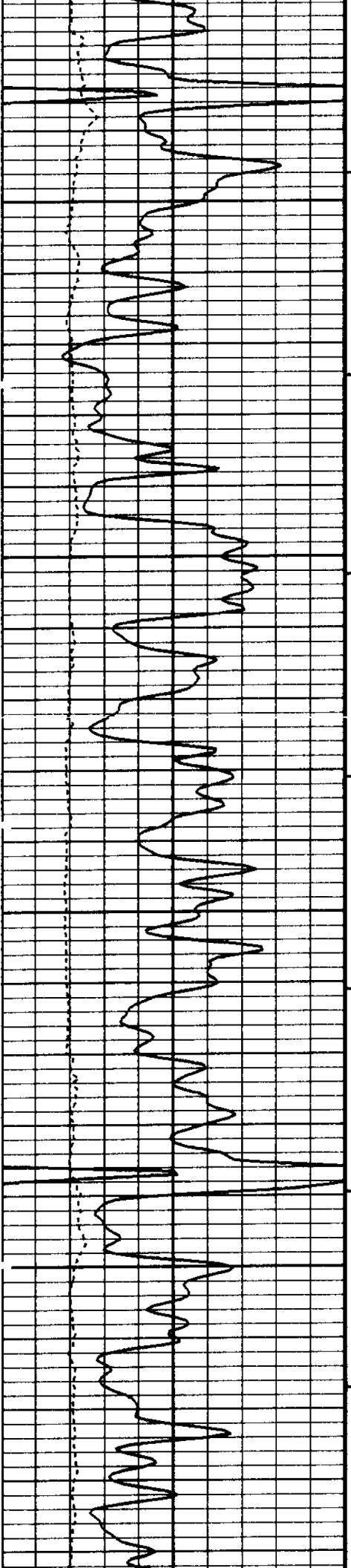
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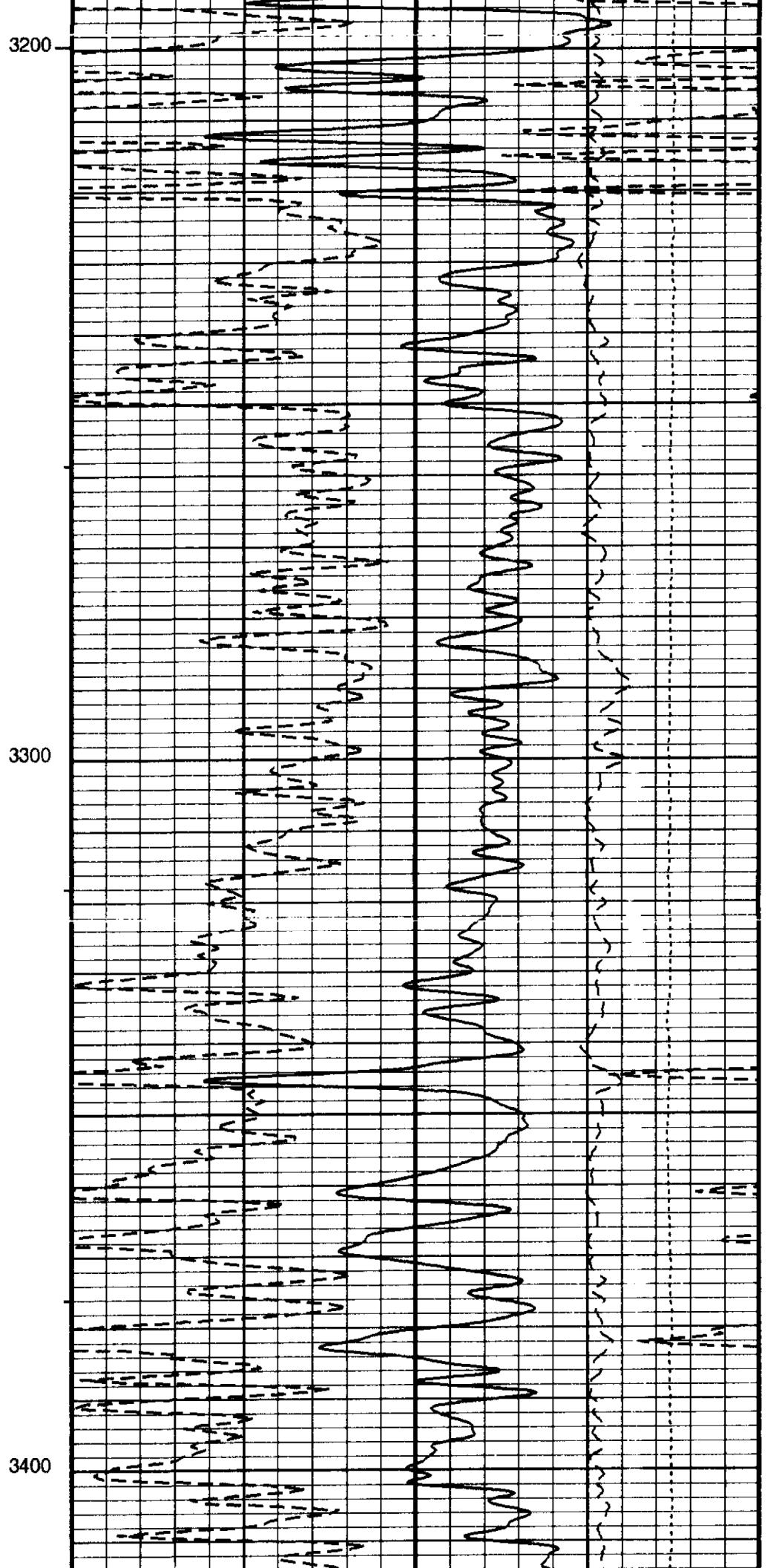
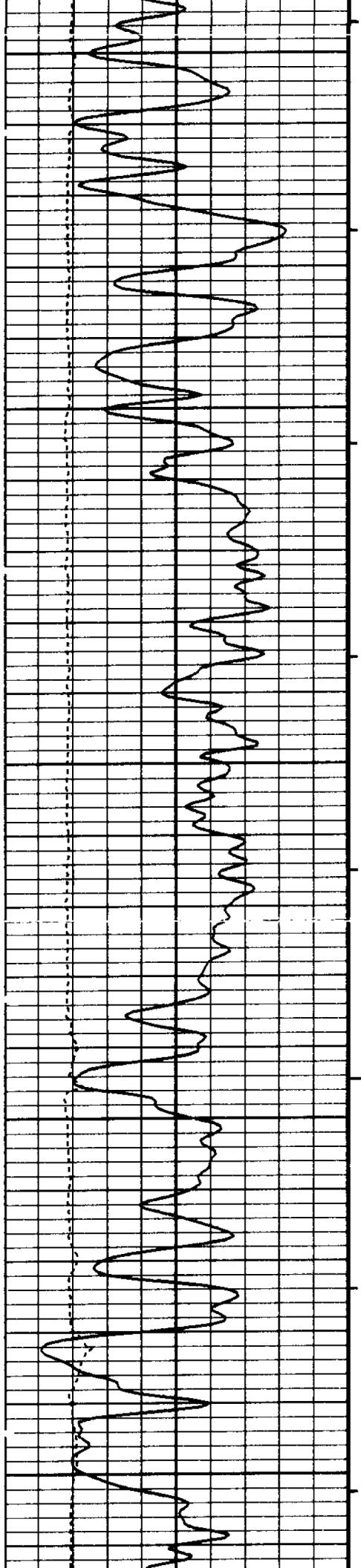


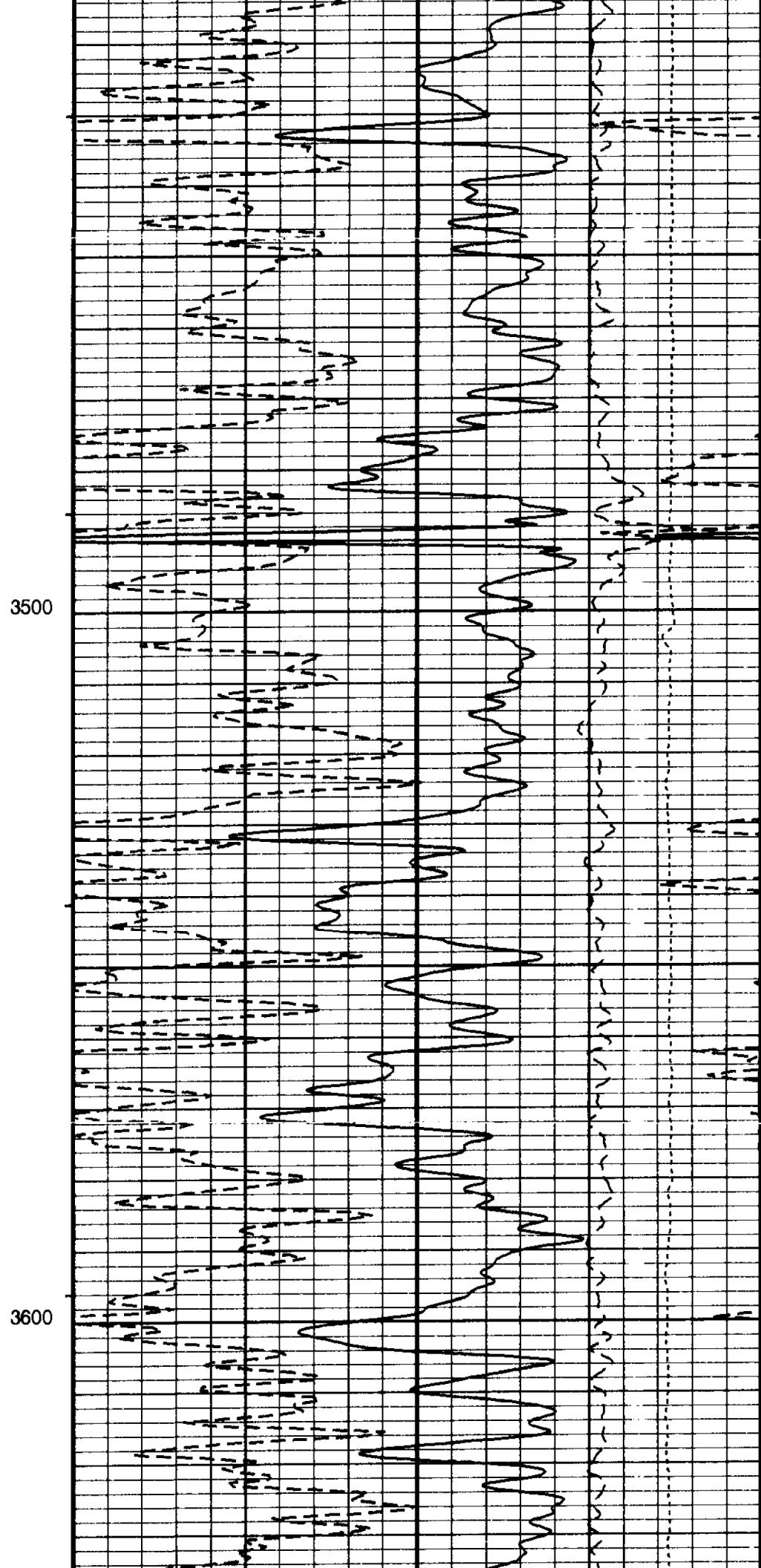
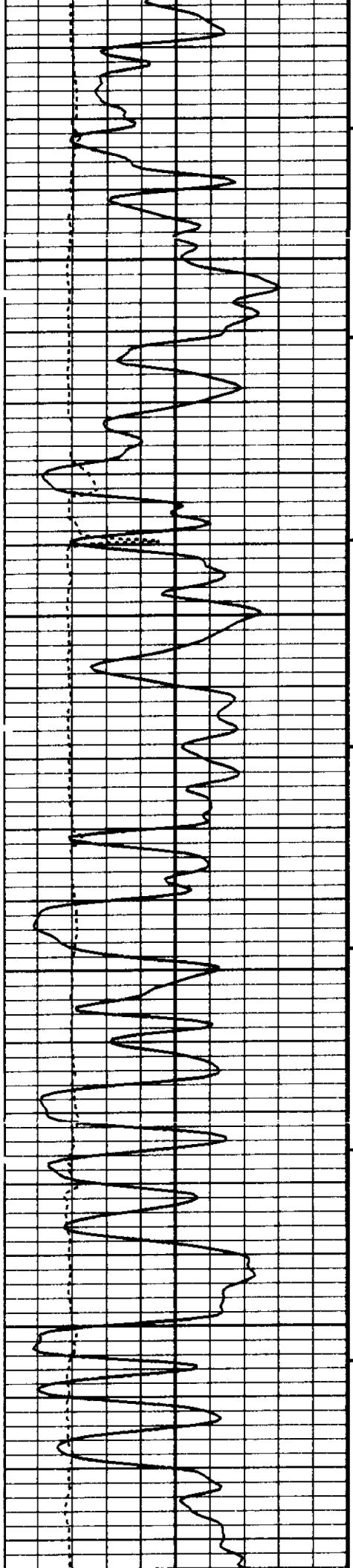


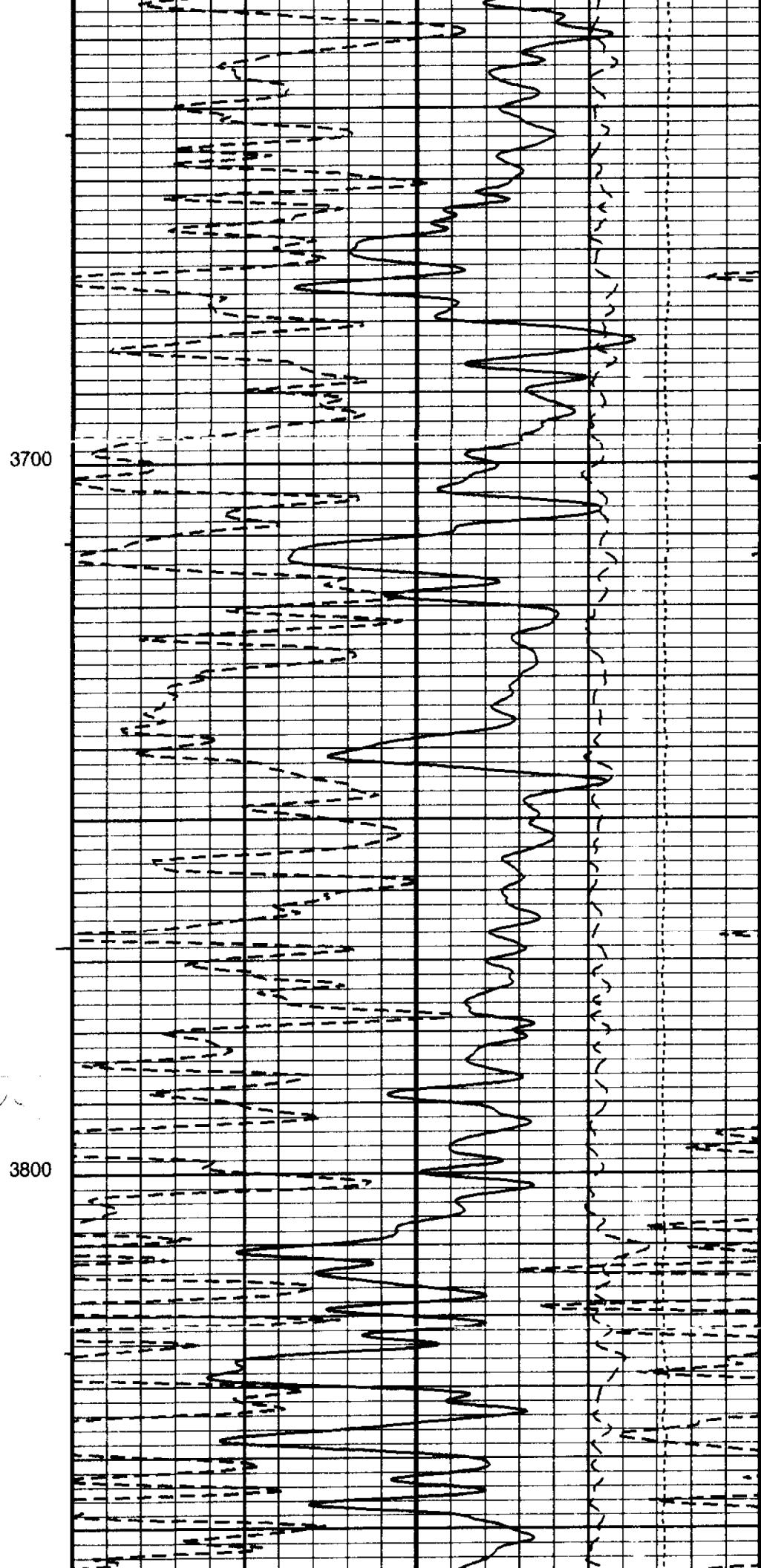
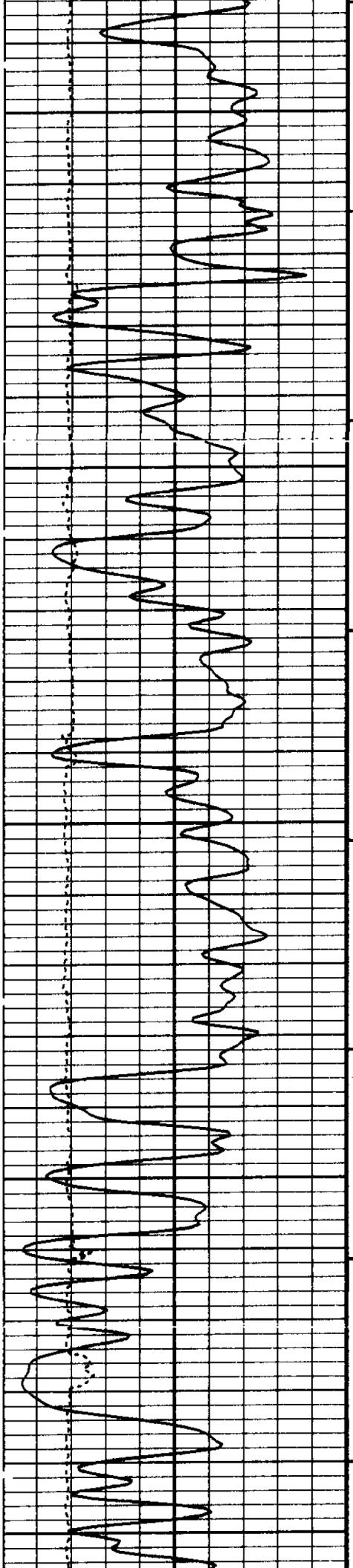


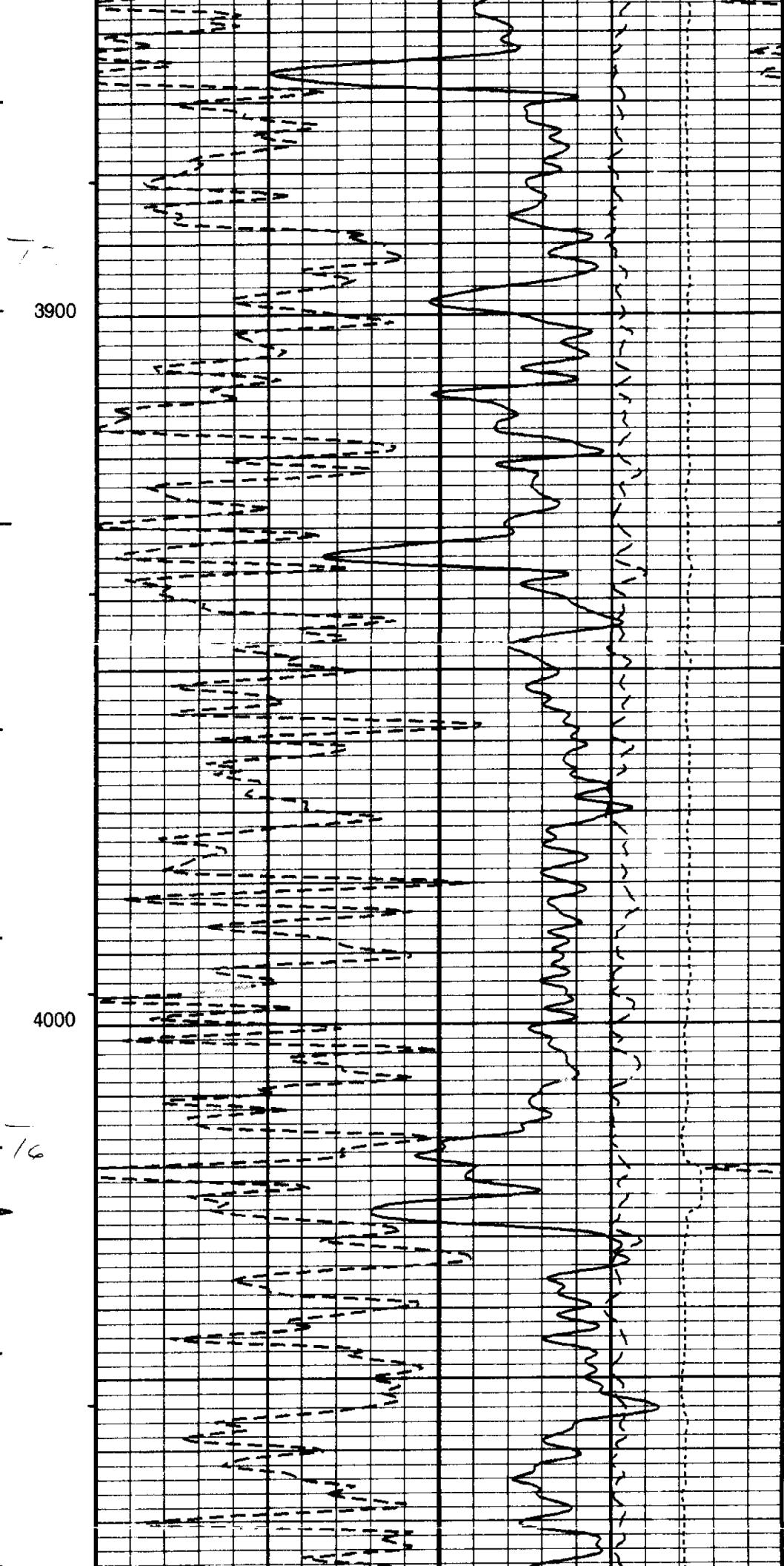
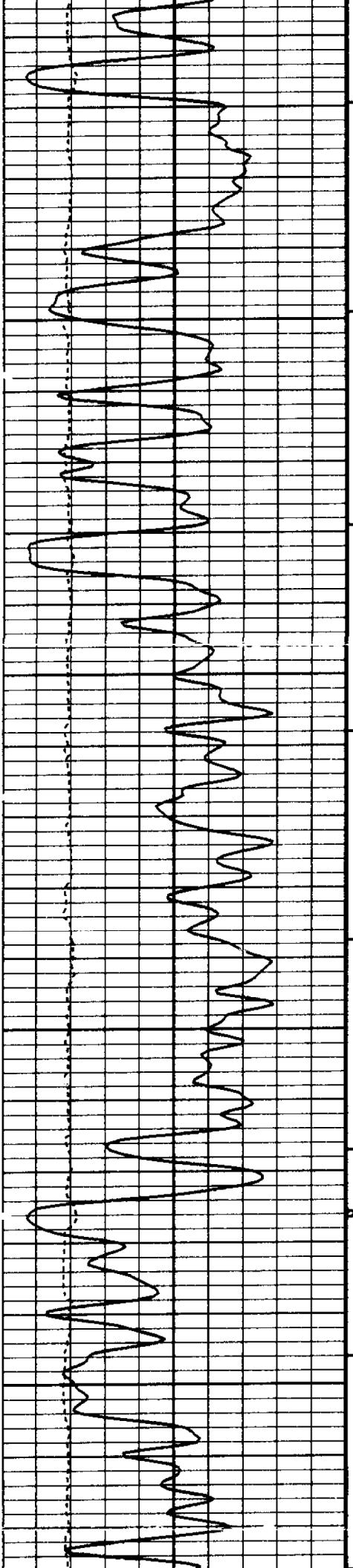


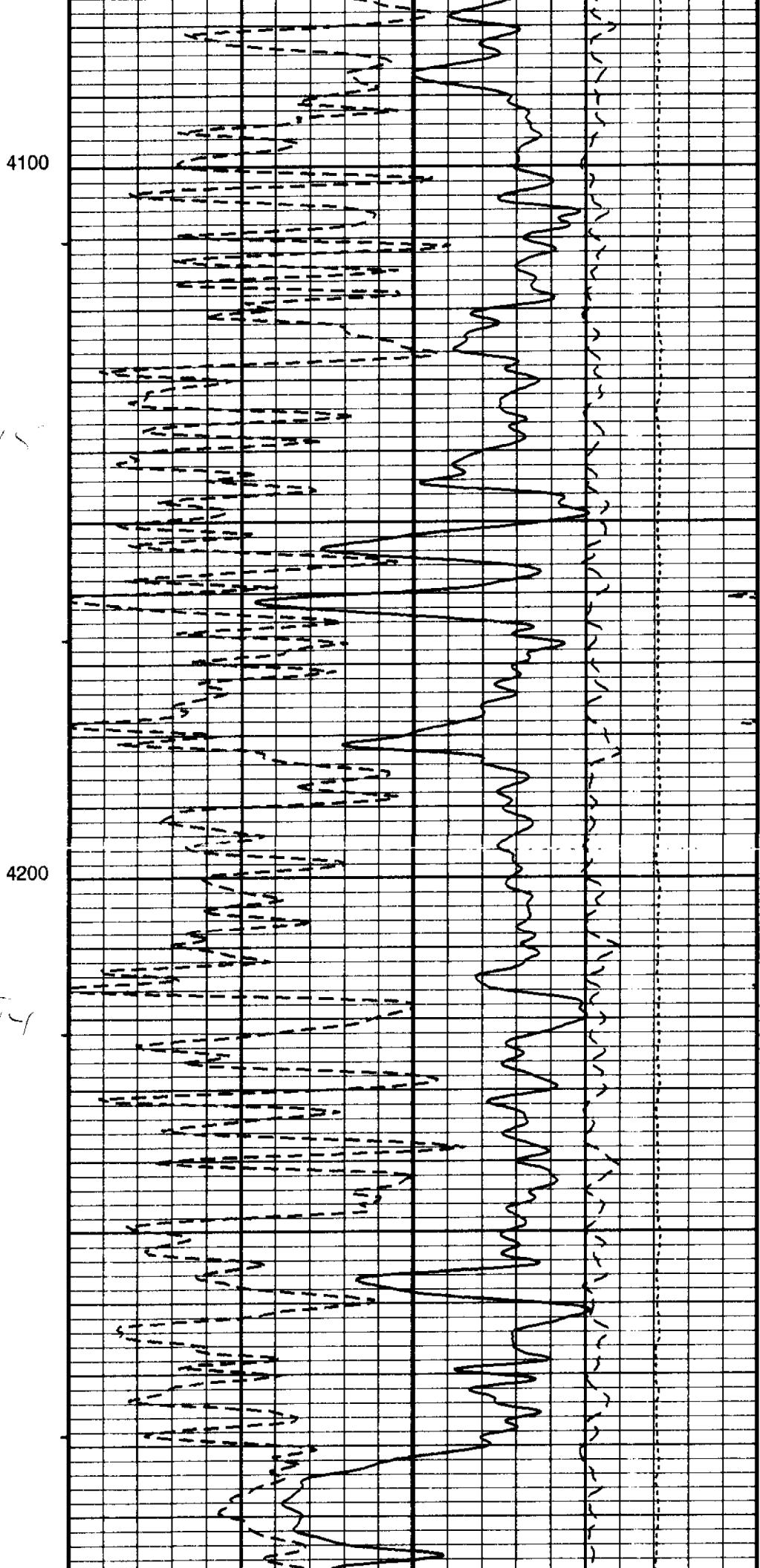
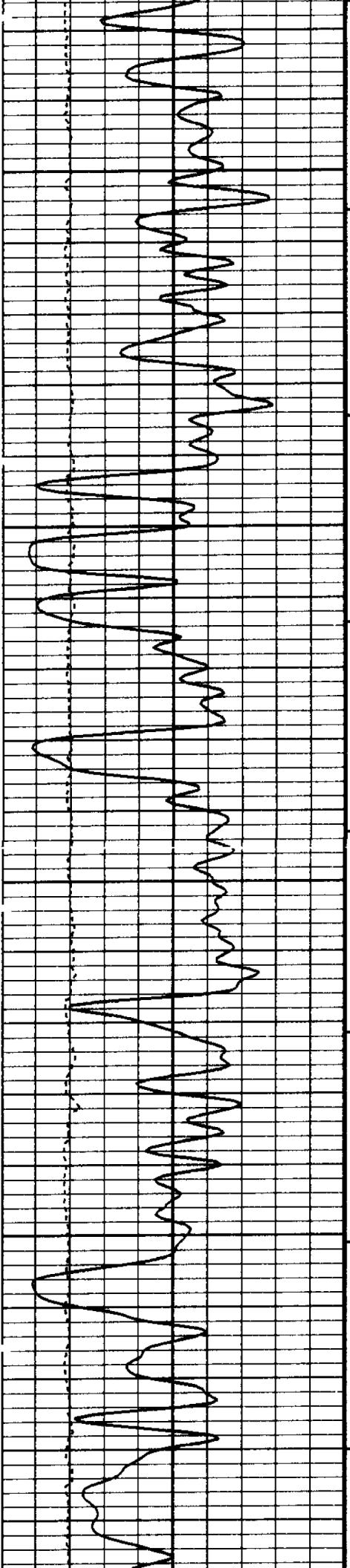


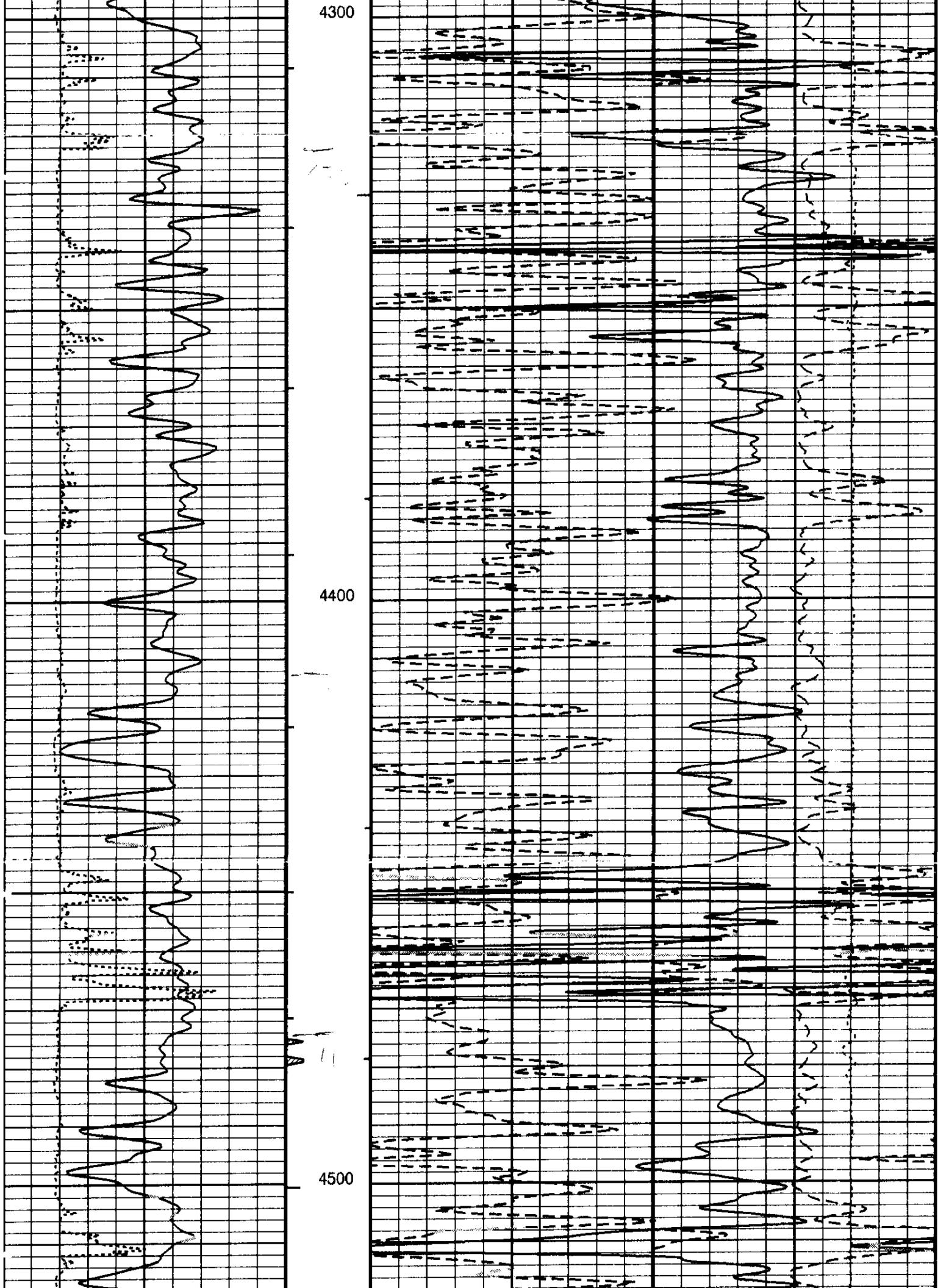


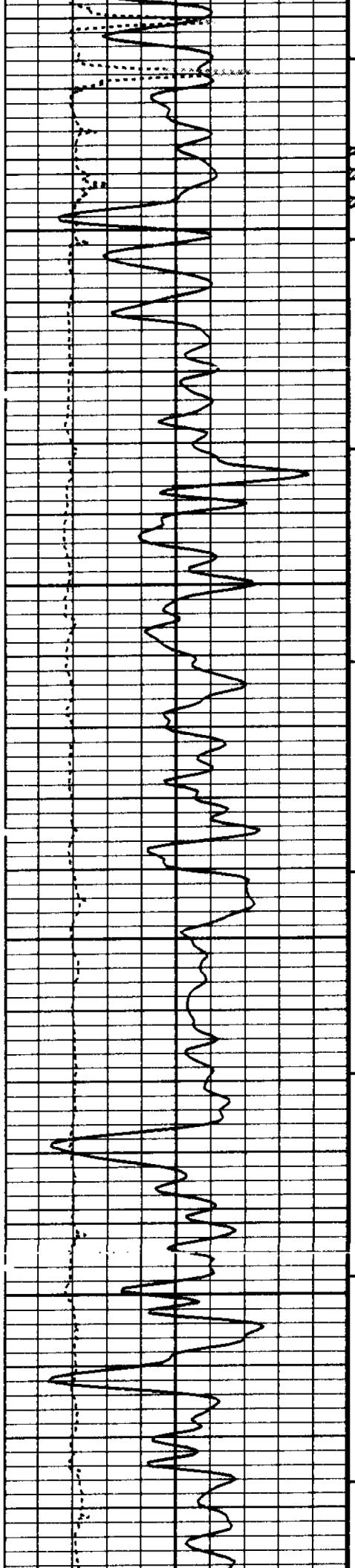










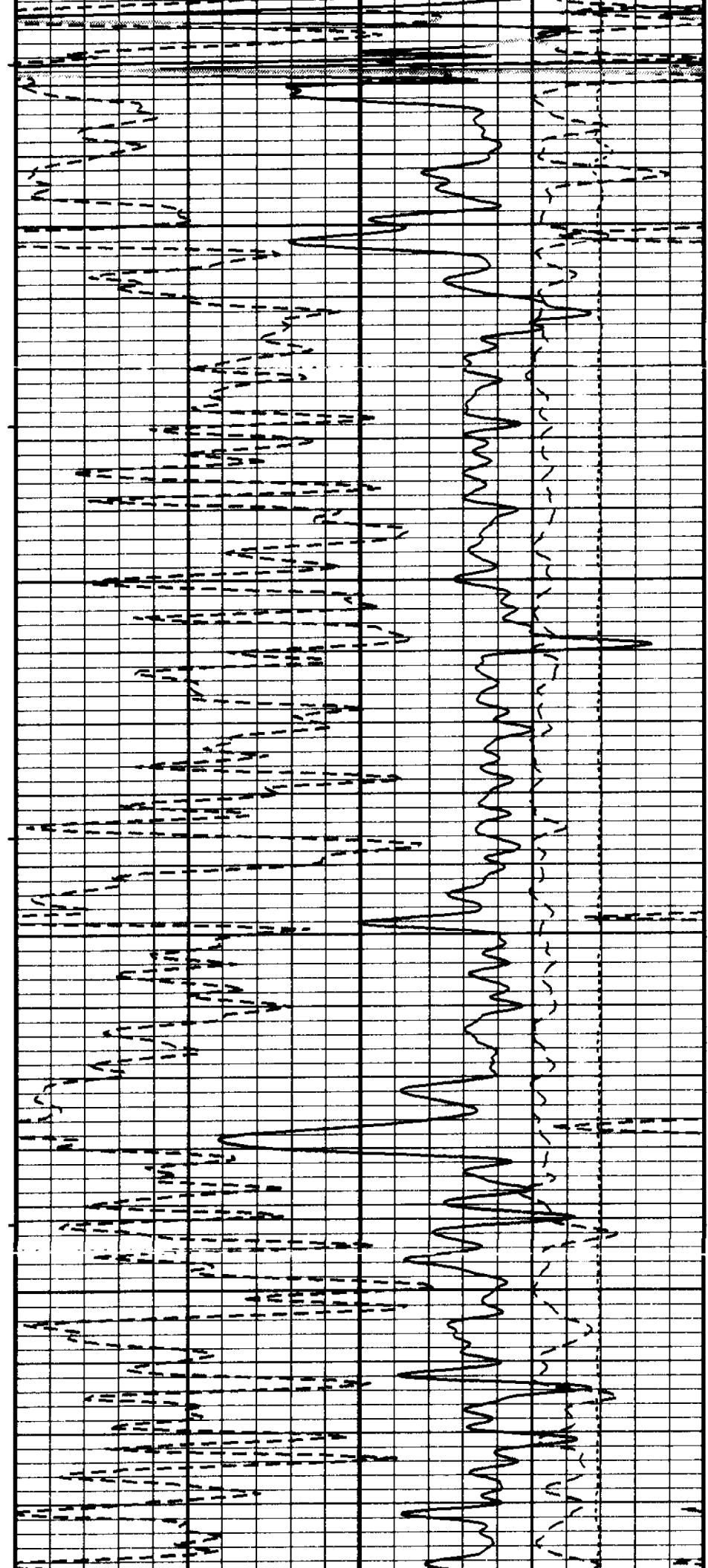


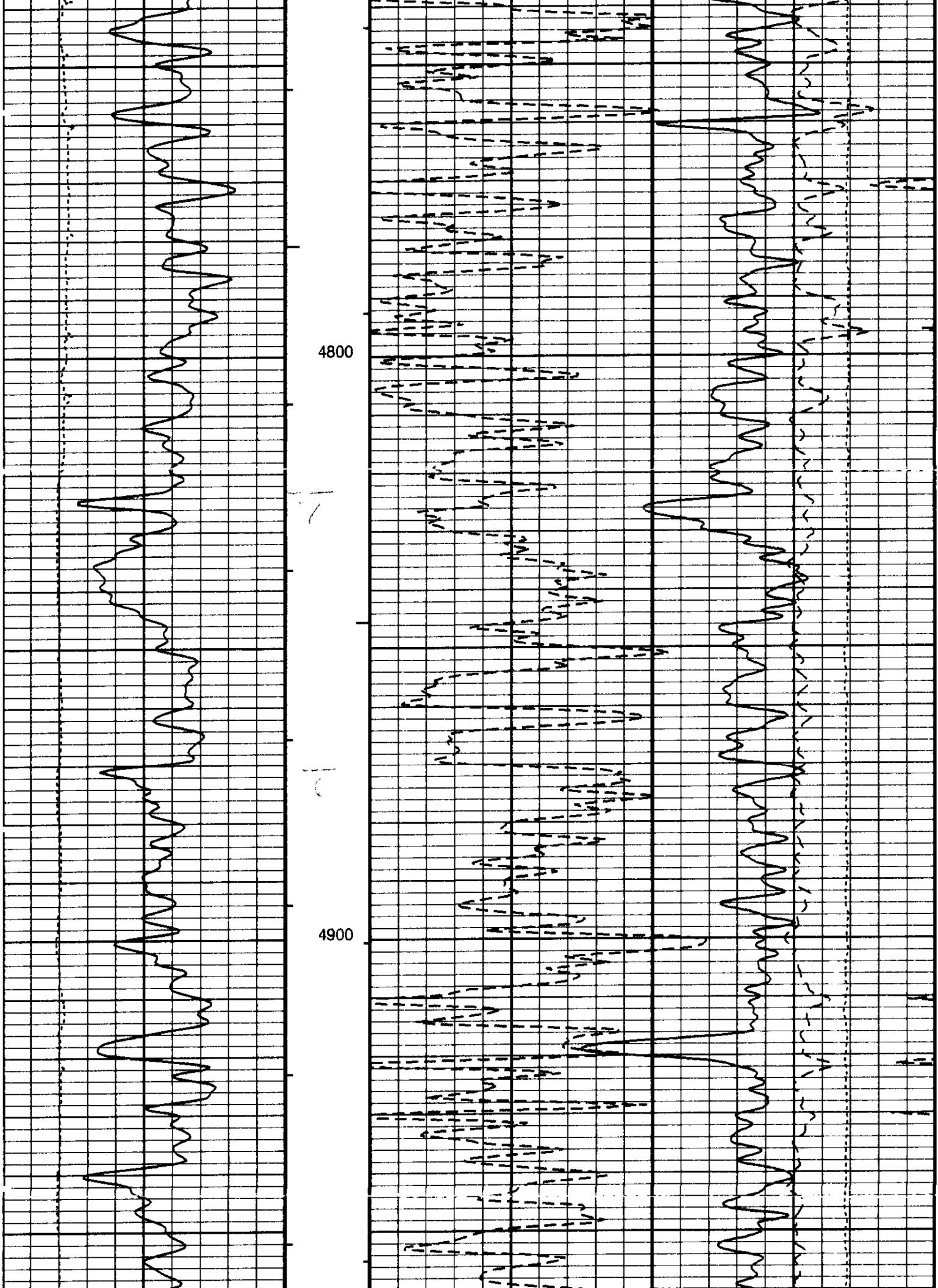
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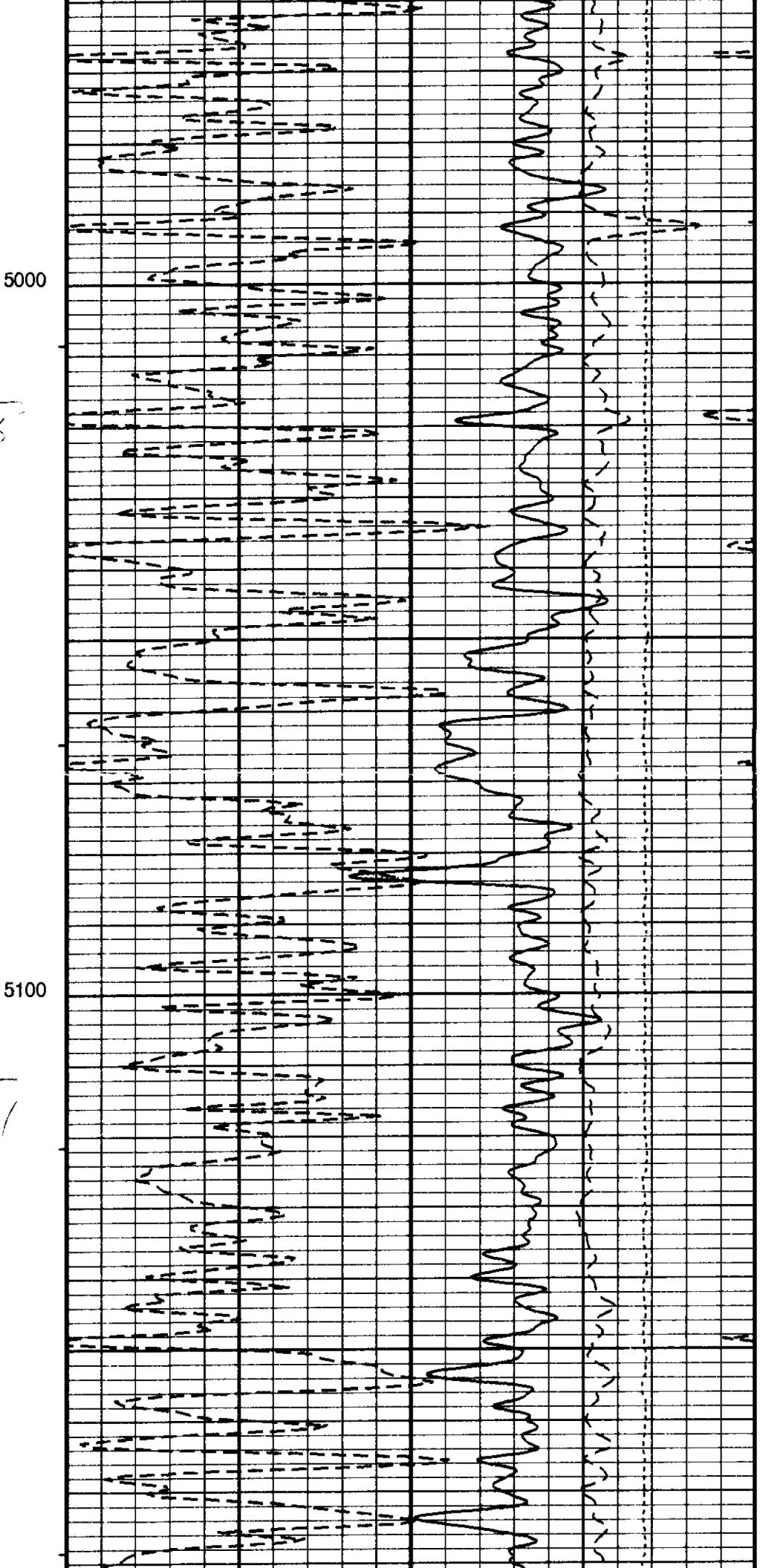
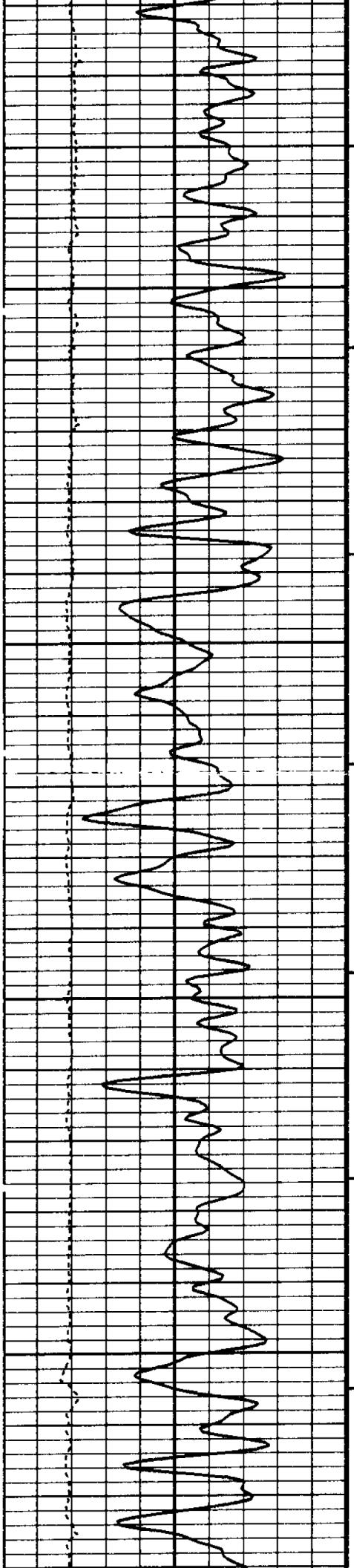
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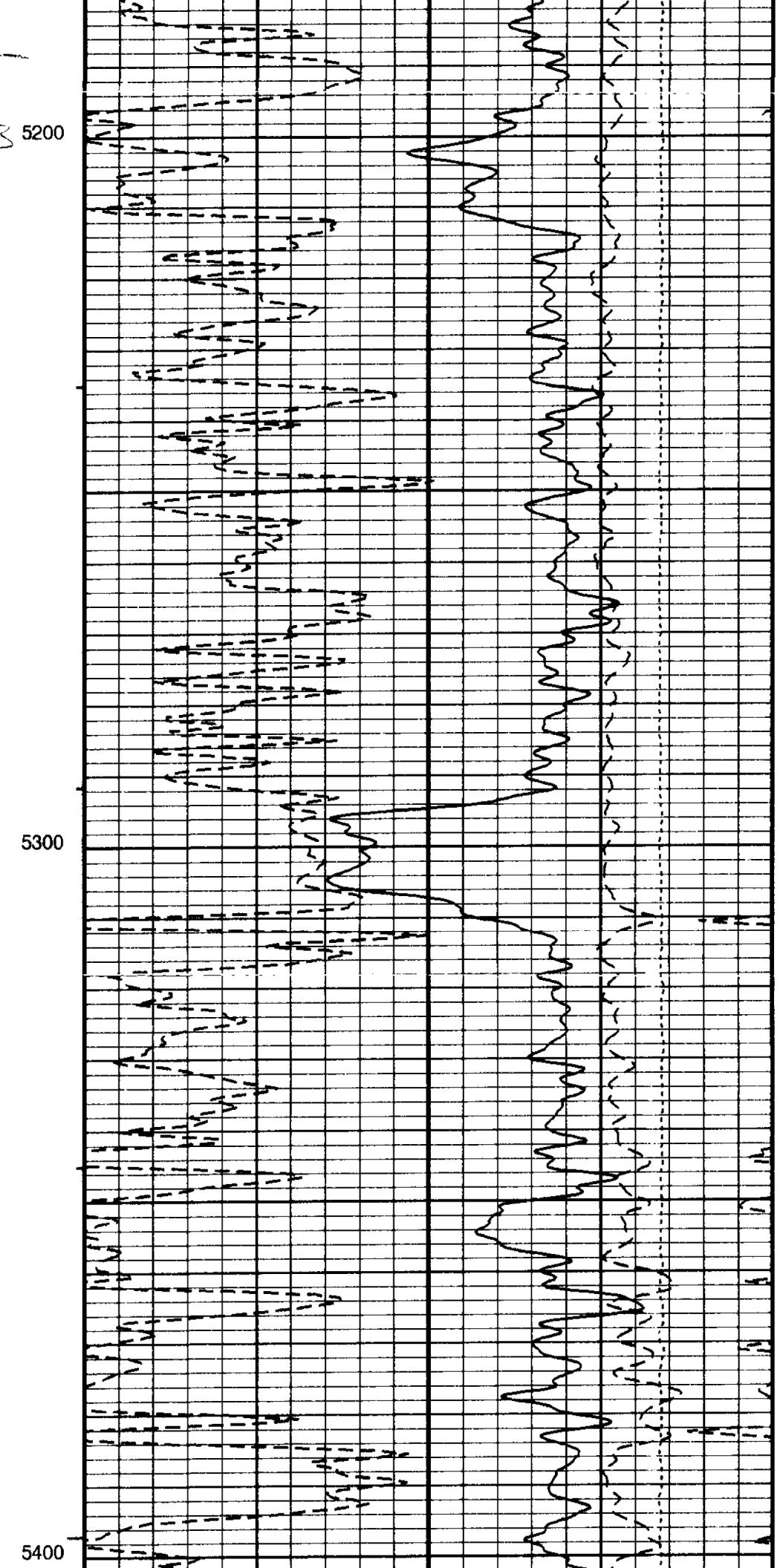
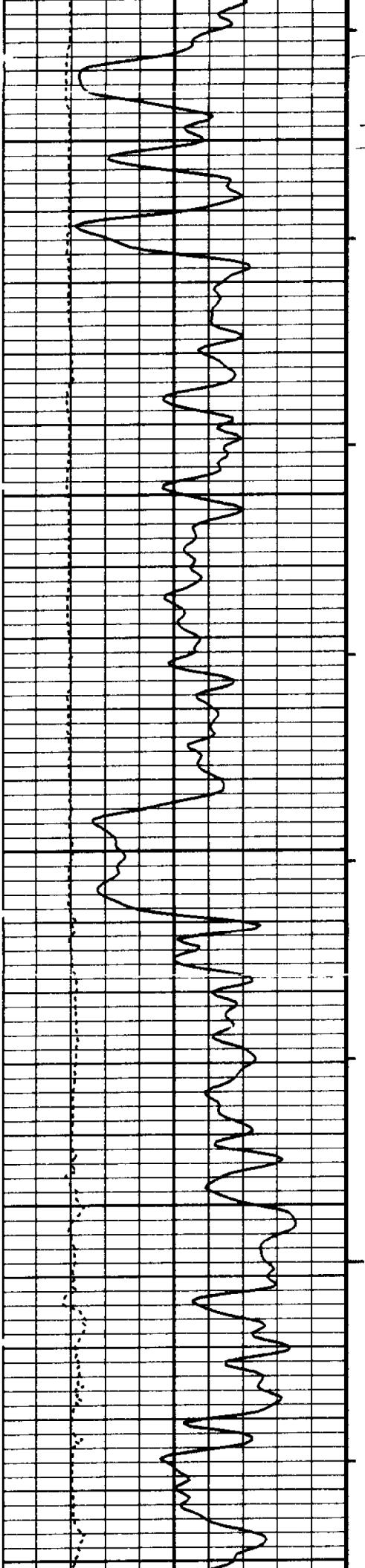
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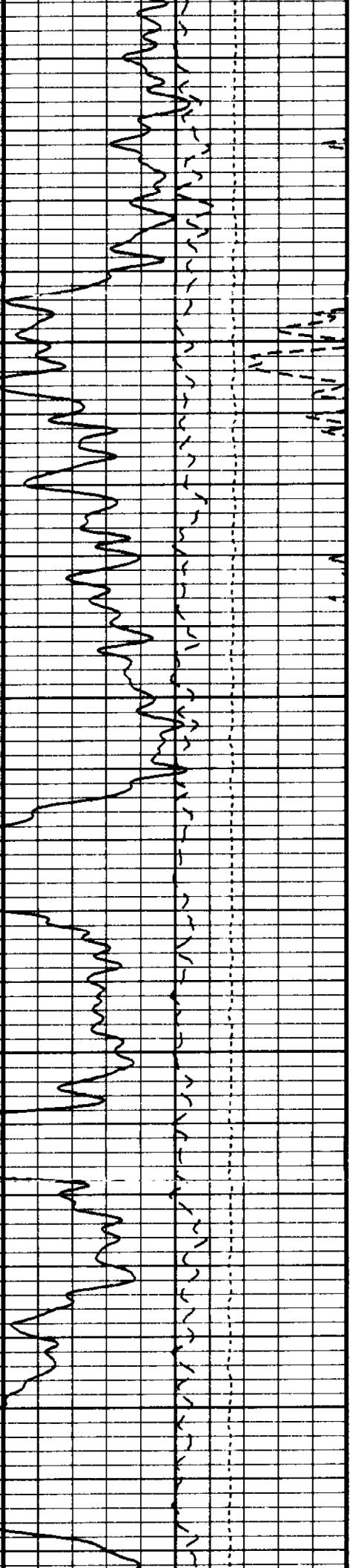
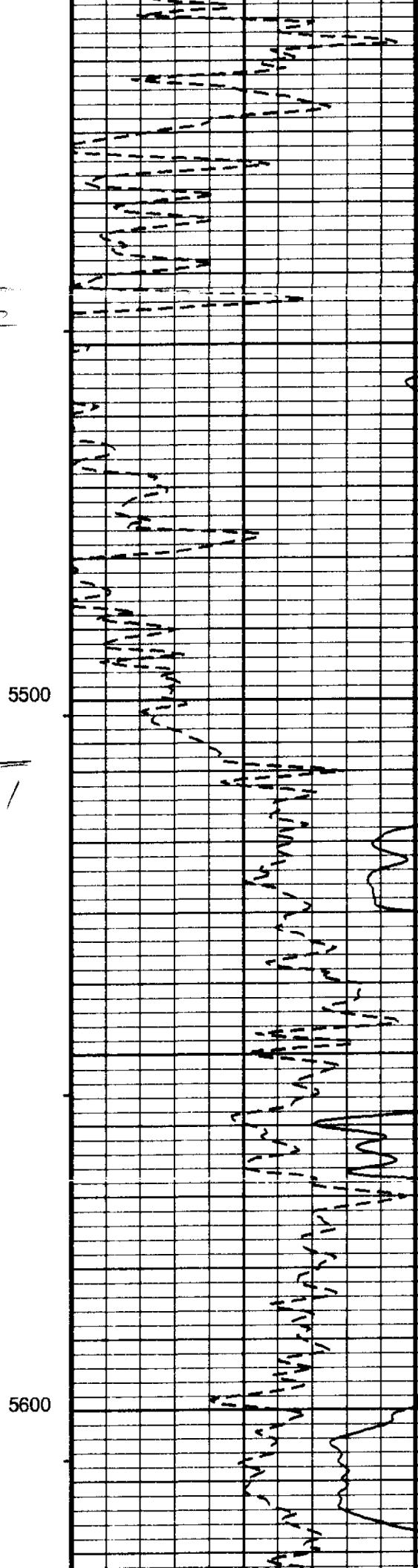
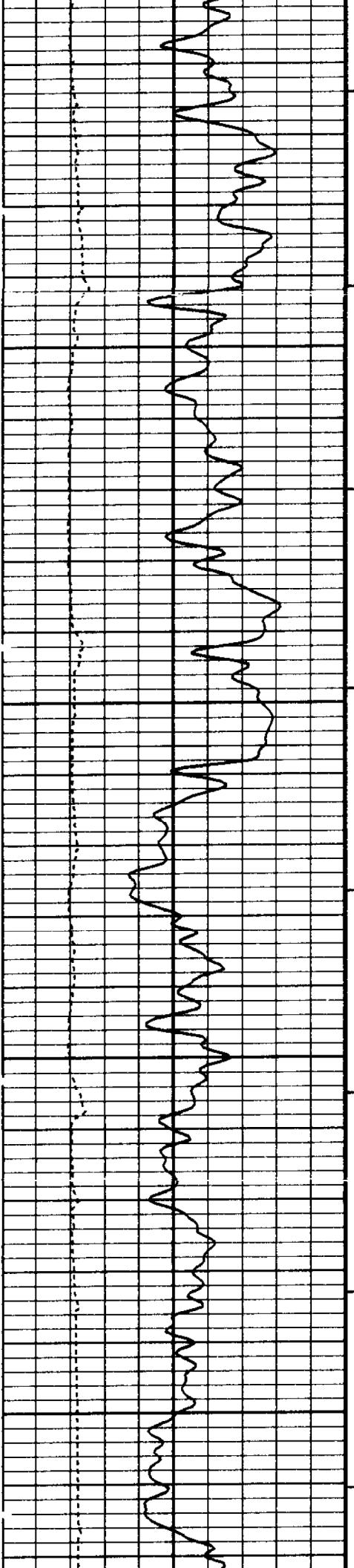
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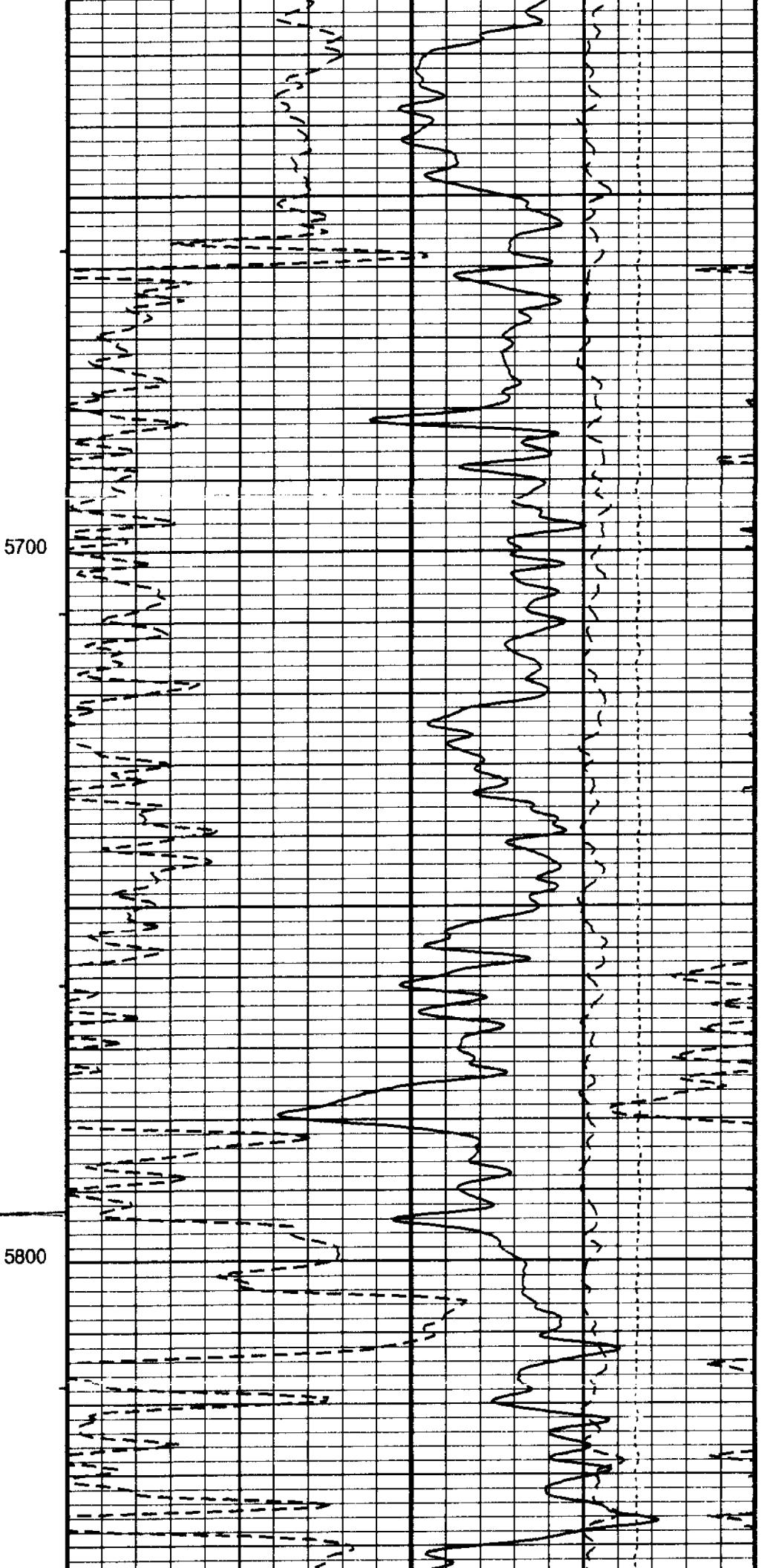
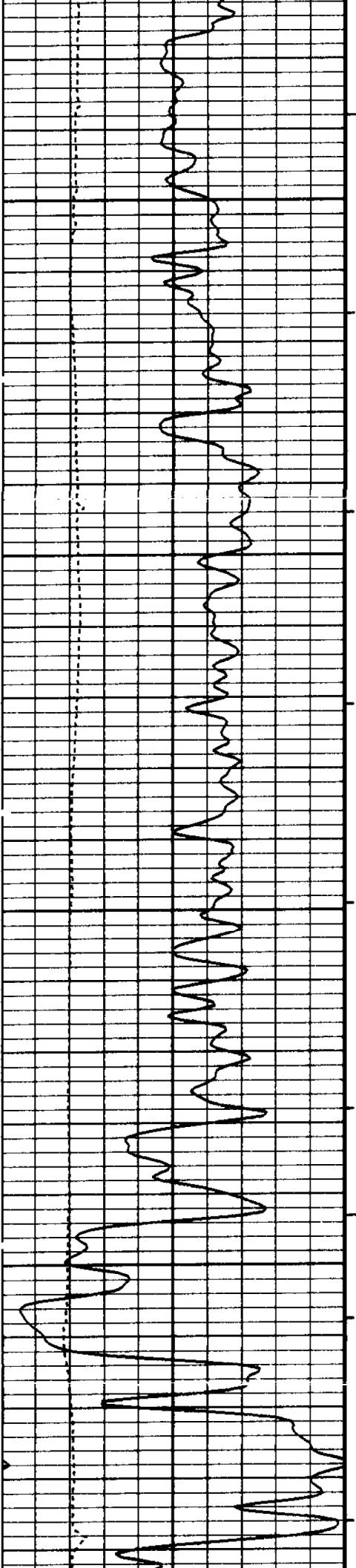


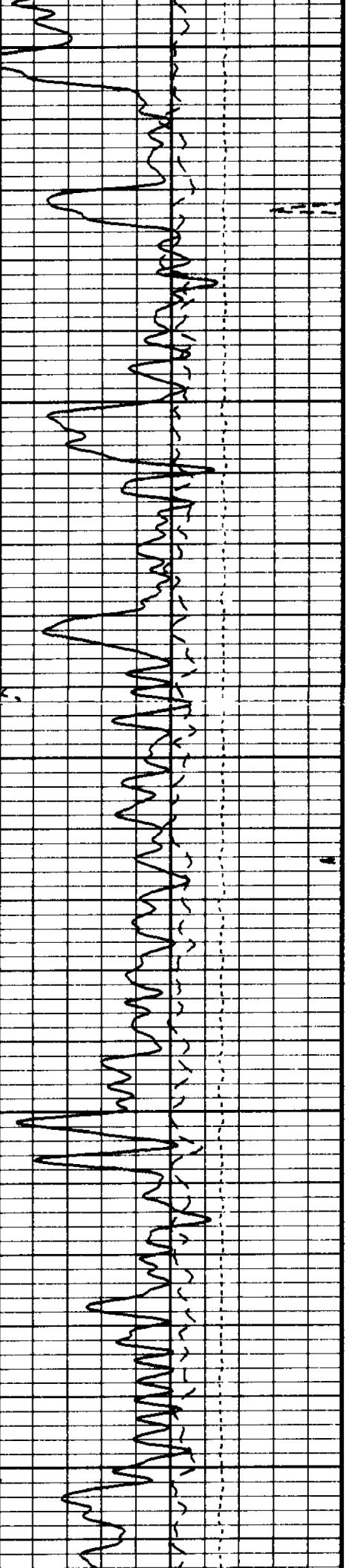
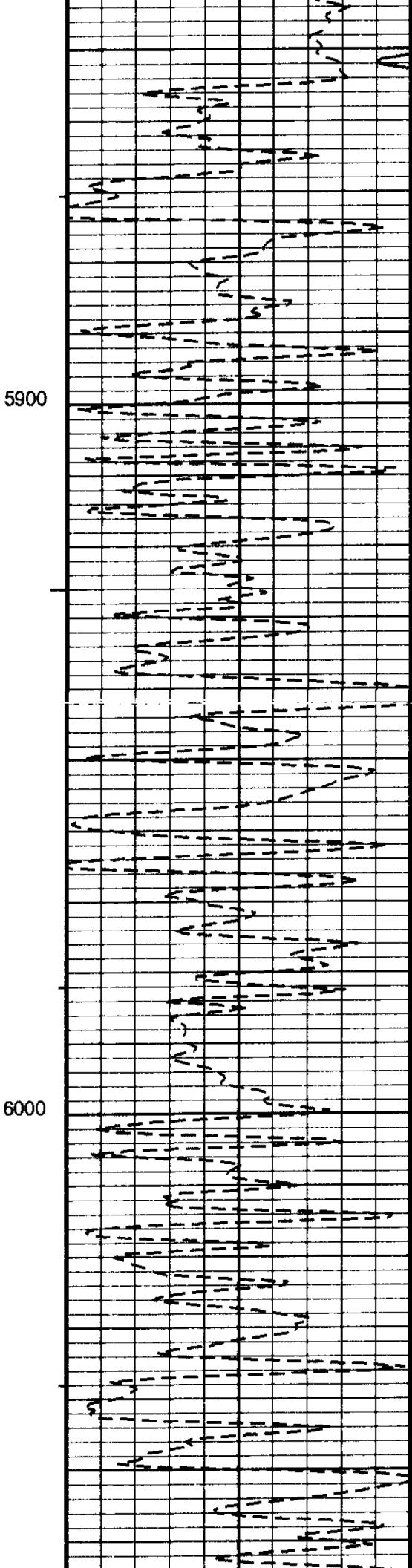
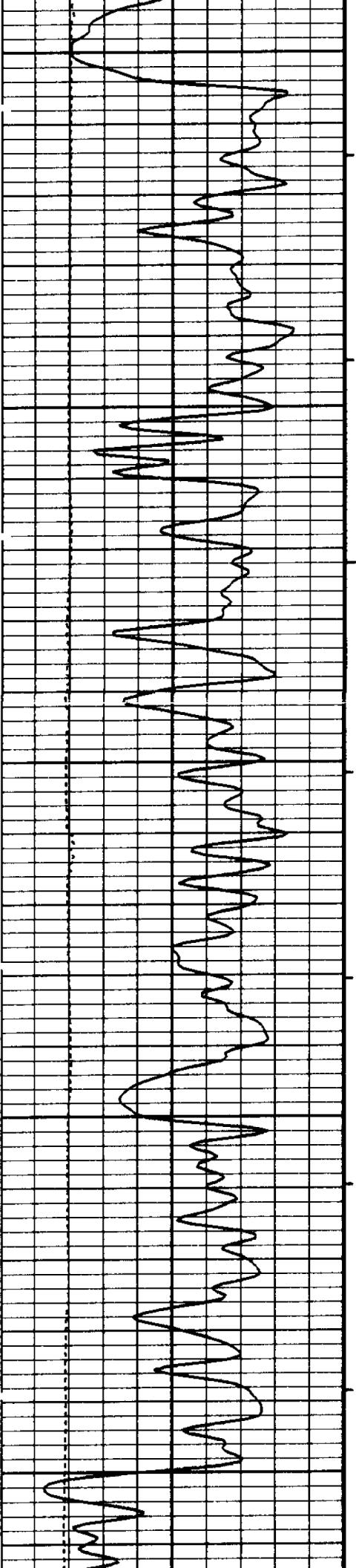


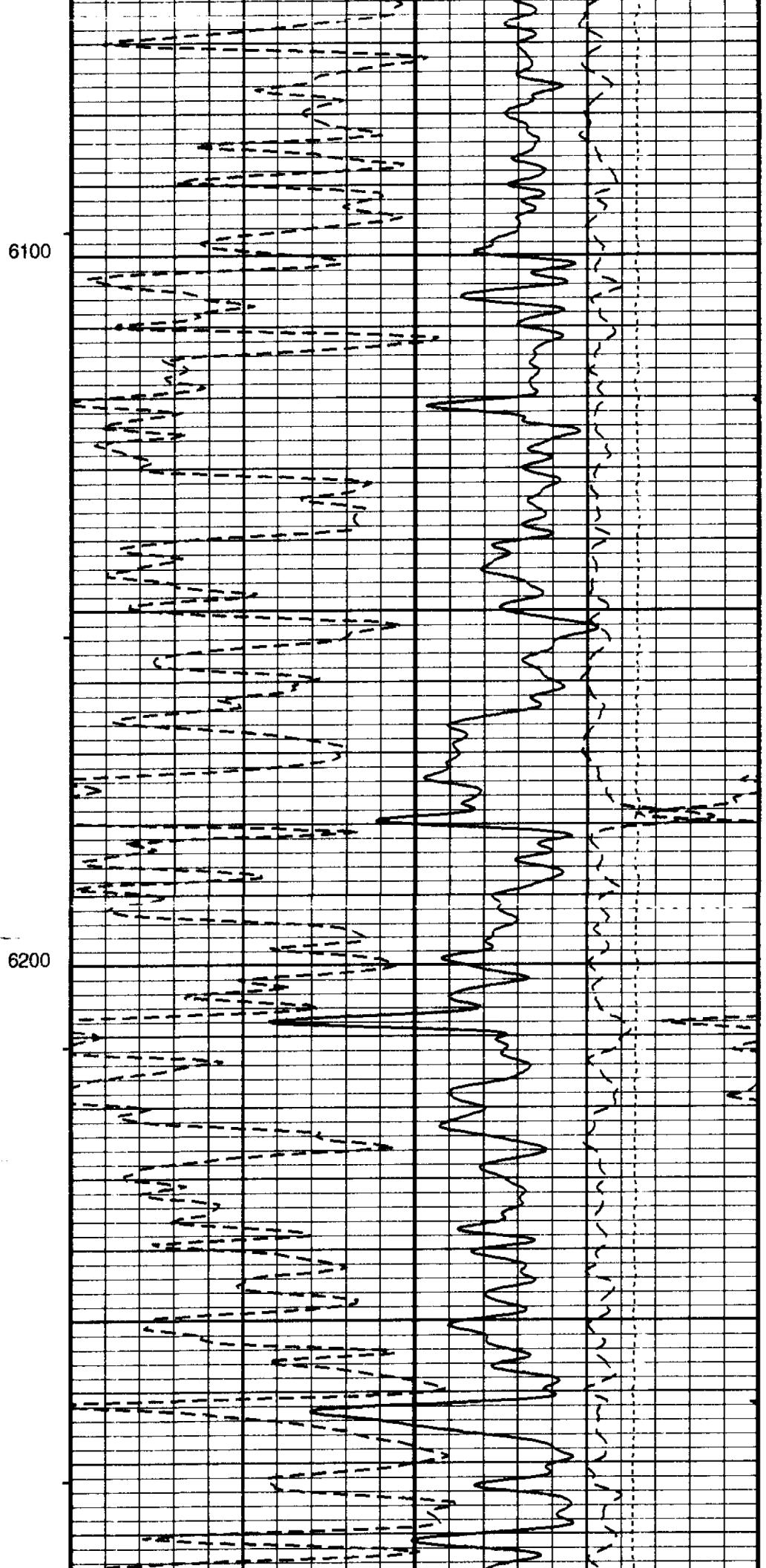
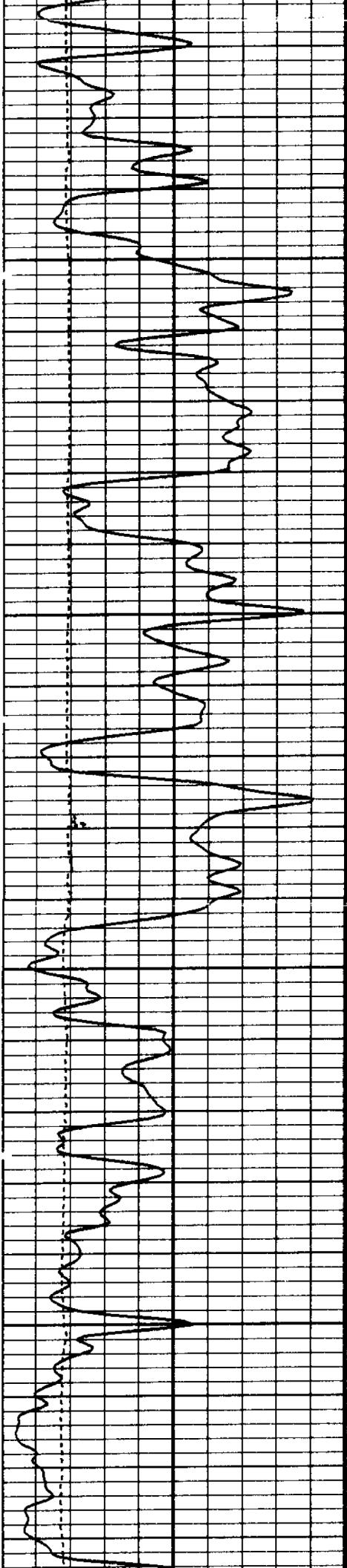


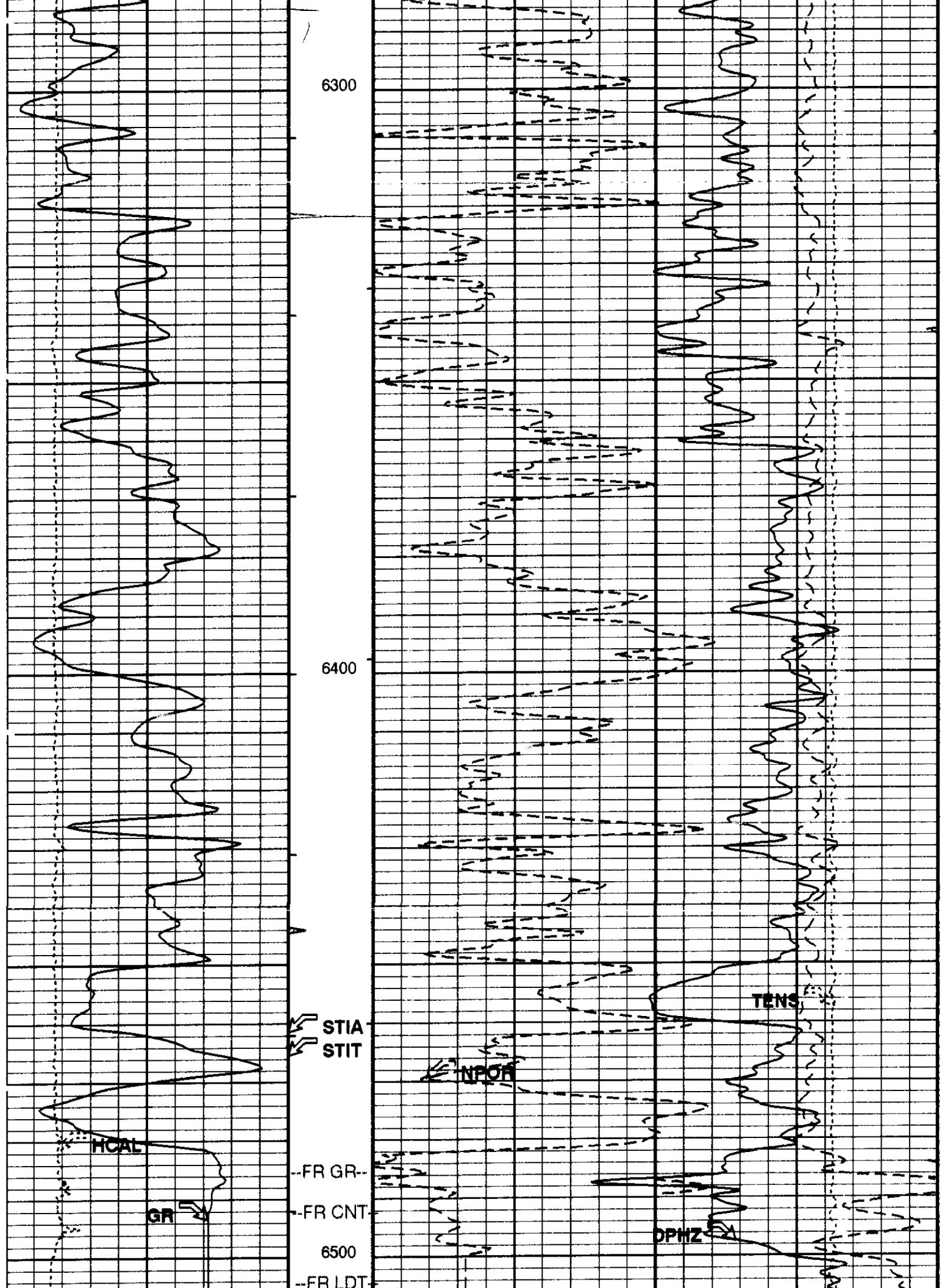












		--TD--	
Gamma Ray (GR)		Stuck Stretch (STIT)	Std. Res. Density Porosity (DPHZ)
0 (GAPI)	200	0 (F) 50	0.3 (V/V) -0.1
Caliper (HCAL)	16 (IN)	Cable Drag From STIA to STIT	Alpha Processed Neutron Porosity (NPOR) (V/V) -0.1
		Tool/Tot. Drag From D3T to STIA	GAS EFFECT From DPHZ to NPOR
<b>MAIN PASS</b>		<b>Density Correction (HDRA)</b>	
SANDSTONE MATRIX, 2.68 G/CC		-0.25 (G/C3) 0.25	
		<b>Tension (TENS)</b>	
10000 (LBF) 0			

#### PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
  - Integrated Cement Volume Minor Pip Every 10 F3
  - Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

#### Parameters

DLIS Name	Description	Value
BHFL	Borehole Fluid Type	WATER
BHS	Bore Hole Status	OPEN
BS	Bit Size	7.875 IN
BSAL	Borehole Salinity	1600.00 PPM
BSCO	Borehole Salinity Correction Option	NO
CCCO	Casing & Cement Thickness Correction Option	NO
CWEI	Casing Weight	-50000.00 LB/F
DFD	Drilling Fluid Density	8.60 LB/G
DHC	Density Hole Correction	BS
DORL	Depth Offset Repeat Analysis	0.0 FT
FD	Fluid Density	1 G/C3
FSAL	Formation Salinity	-50000 PPM
FSCO	Formation Salinity Correction Option	NO
GCSE	Generalized Caliper Selection	HCAL
GDEV	Average Angular Deviation of Borehole from Normal	0 DEG
GGRD	Geothermal Gradient	1.000000e-02 DF/F
HMPCO	HILT RTSC Measure points correction	NO
HSCM	HILT Speed Correction Mode	TSCD_SpeedCorrect
HSCO	Hole Size Correction Option	YES
HSTI	STI Uses HILT Acceleration	YES
MATR	Rock Matrix Type	SANDSTONE
MCCO	Mud Cake Correction Option	NO
MCOR	Mud Correction	NATU
MDEN	Matrix Density	2.68 G/C3
MST	Mud Sample Temperature	49.00 DEGF
MWCO	Mud Weight Correction Option	NO
NIAV	HRDD Density/Ps Algorithm Version	1
NMT	HILT Nuclear Mud Type	NOBARITE
NPRM	HRDD Processing Mode	StdRes
NSAR	HRDD Depth Sampling Rate	1 IN
PTCO	Pressure/Temperature Correction Option	NO
RMFS	Resistivity of Mud Filtrate Sample	2.3700 OHMM
SDAT	Standoff Data Source	SOCN
SHT	Surface Hole Temperature	49 DEGF
SOCN	Standoff Distance	0.125 IN
SOCO	Standoff Correction Option	YES
STKT	STI Stuck Threshold	2.5 FT

# OP System Version: 7C0-427

DBM

HILTB-CTS HOLEV	RPCVX-680 RPCVX-680	ALLRES PERT	RPCVX-680 RPCVX-680
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## Output DLIS Files

DEFAULT	HILTC .004	FN:3	FIELD	31-OCT-1996 18:30
REDUCED	HILTC .004	FN:4	CUST	31-OCT-1996 18:30

## Input DLIS Files

DEFAULT	HILTC .003	FN:2	FIELD	31-OCT-1996 18:02	6534.0 FT	6098.5 FT
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## Output DLIS Files

DEFAULT	HILTC .004	FN:3	FIELD	31-OCT-1996 18:30
REDUCED	HILTC .004	FN:4	CUST	31-OCT-1996 18:30

## Integrated Hole/Cement Volume Summary

Hole Volume = 138.27 F3

Cement Volume = 68.82 F3 (assuming 5.50 IN casing O.D.)

Computed from 6524.0 FT to 6103.5 FT using data channel(s) HCAL

# OP System Version: 7C0-427

DBM

HILTB-CTS HOLEV	RPCVX-680 RPCVX-680	ALLRES PERT	RPCVX-680 RPCVX-680
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## PIP SUMMARY

- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
  - Integrated Cement Volume Minor Pip Every 10 F3
  - Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

TENS REP Curve (TENS REP)  
10000 (LBF) 0

## REPEAT ANALYSIS

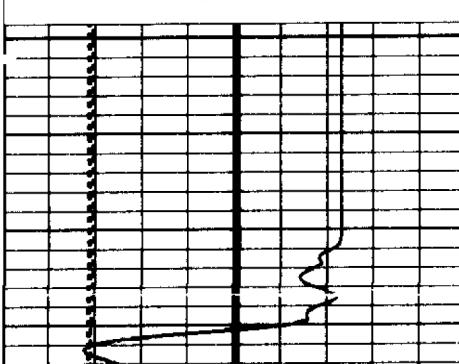
HDRA REP Curve (HDRA REP)  
-0.25 (G/C3) 0.25

SANDSTONE MATRIX, 2.68 G/CC

## GAS EFFECT From DPHZ to NPOR

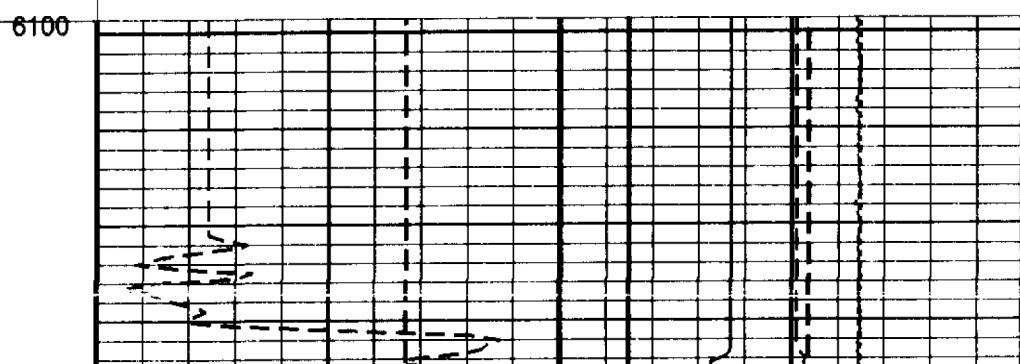
HCAL REP Curve (HCAL REP)  
6 (IN) 16

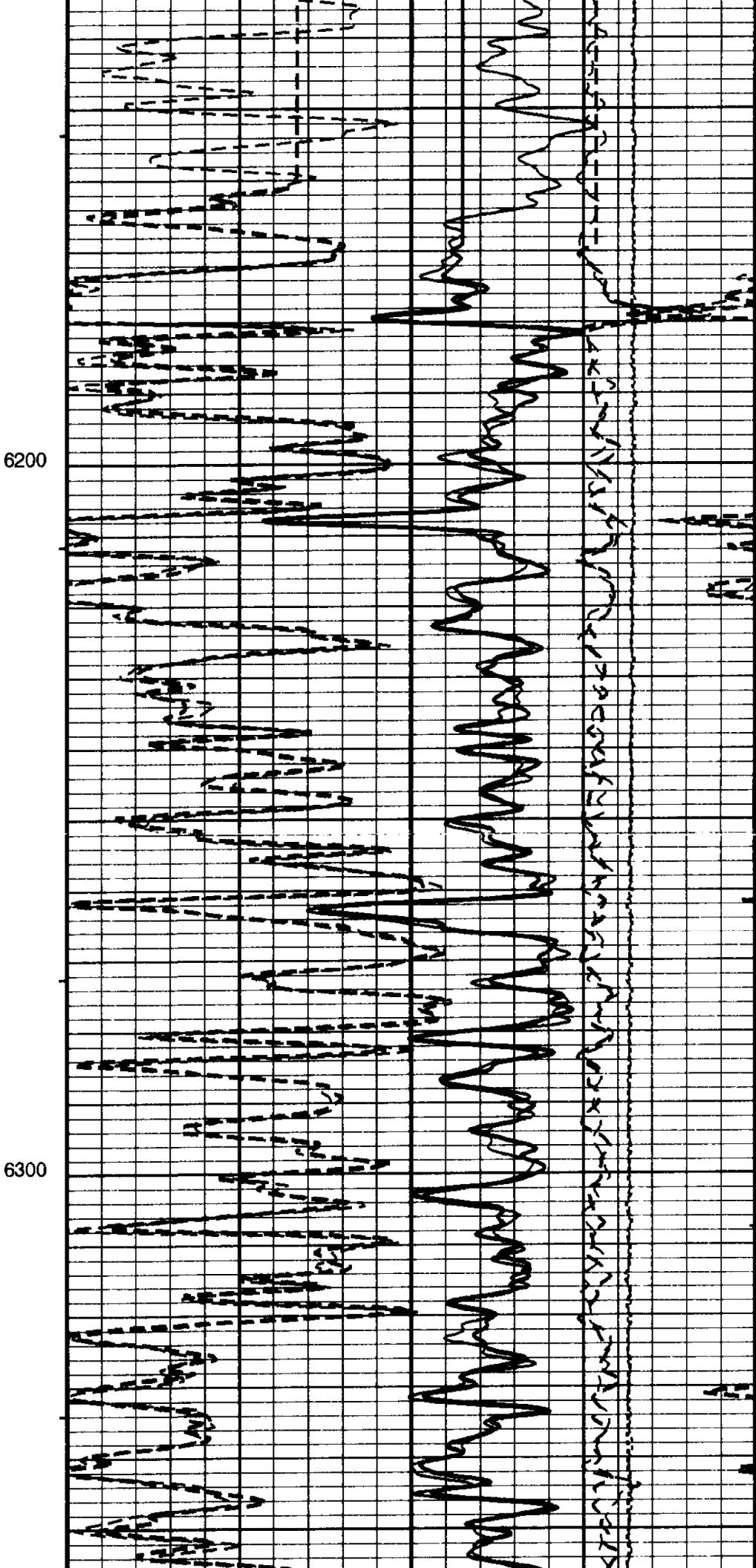
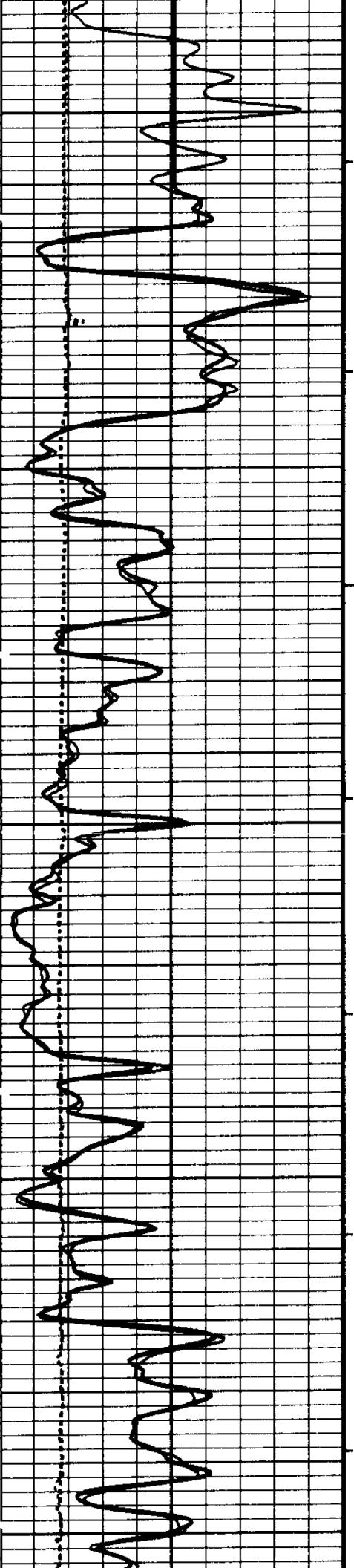
GR REP Curve (GR REP)  
0 (GAPI) 200

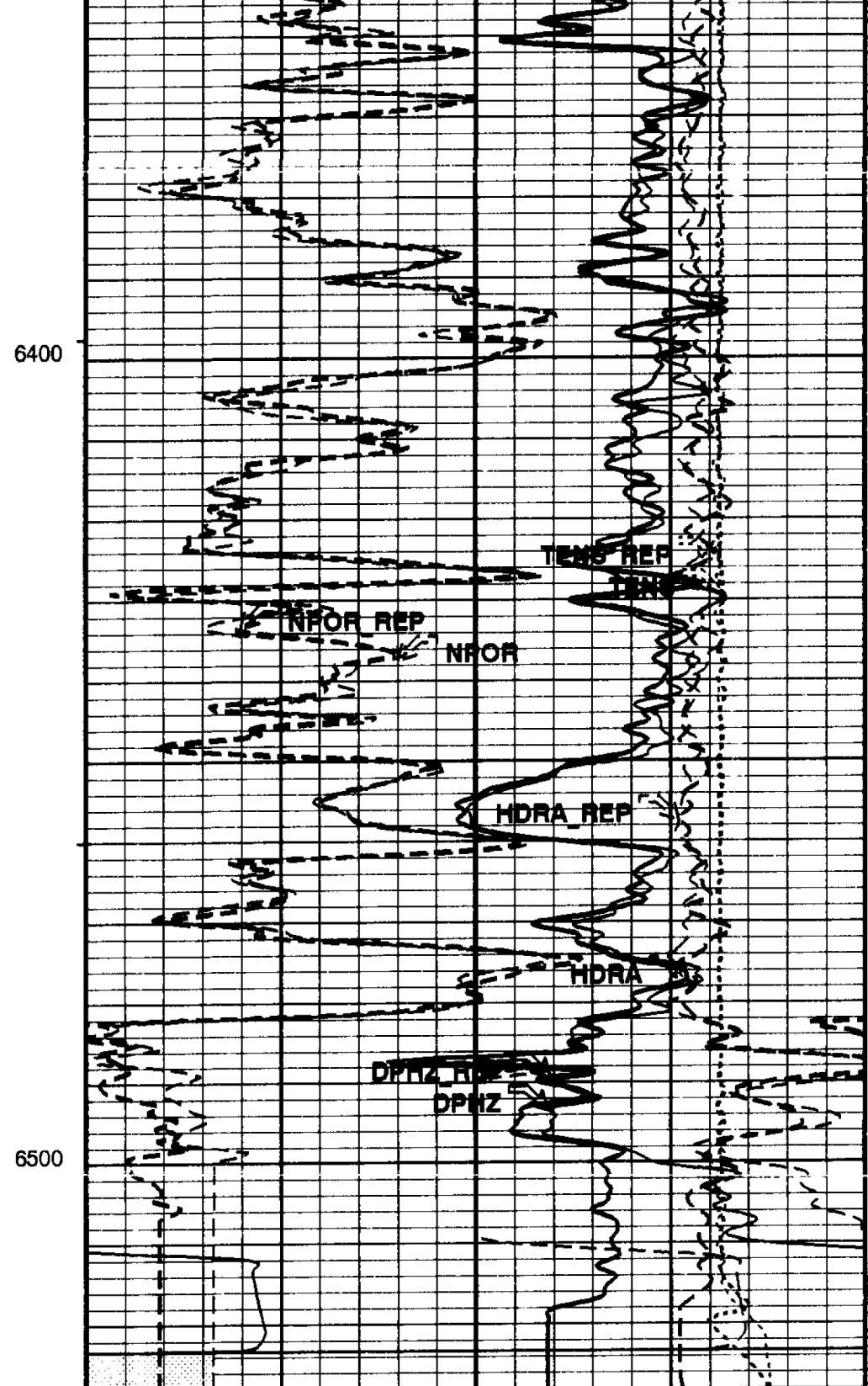
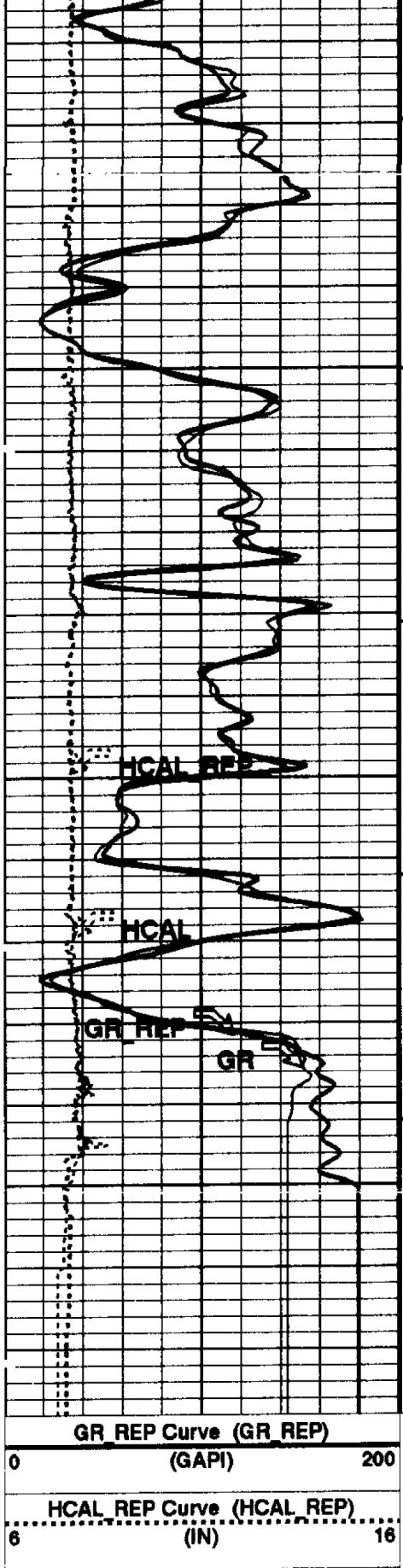


NPOR REP Curve (NPOR REP)  
0.3 (V/V) -0.1

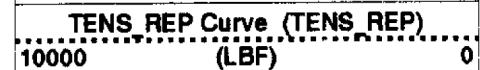
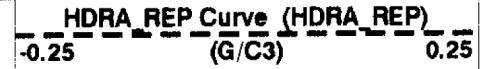
DPHZ REP Curve (DPHZ REP)  
0.3 (V/V) -0.1







GAS EFFECT  
From DPHZ to NPOR



REPEAT ANALYSIS

SANDSTONE MATRIX, 2.68 G/CC

### PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
  - Integrated Cement Volume Minor Pip Every 10 F3
  - Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

### Parameters

DLIS Name	Description	Value
BHFL	Borehole Fluid Type	WATER
BHS	Bore Hole Status	OPEN
BS	Bit Size	7.875 IN
BSAL	Borehole Salinity	1600.00 PPM
BSCO	Borehole Salinity Correction Option	NO
CCCO	Casing & Cement Thickness Correction Option	NO
CWEI	Casing Weight	-50000.00 LB/F
DFD	Drilling Fluid Density	8.60 LB/G
DHC	Density Hole Correction	BS
DORL	Depth Offset Repeat Analysis	0.0 FT
FD	Fluid Density	1 G/C3
FSAL	Formation Salinity	-50000 PPM
FSCO	Formation Salinity Correction Option	NO
GCSE	Generalized Caliper Selection	HCAL
GDEV	Average Angular Deviation of Borehole from Normal	0 DEG
GGRD	Geothermal Gradient	1.000000e-02 DF/F
HMPCO	HILT RTSC Measure points correction	NO
HSCM	HILT Speed Correction Mode	TSCD_SpeedCorrect
HSCO	Hole Size Correction Option	YES
HSTI	STI Uses HILT Acceleration	YES
MATR	Rock Matrix Type	SANDSTONE
MCCO	Mud Cake Correction Option	NO
MCOR	Mud Correction	NATU
MDEN	Matrix Density	2.68 G/C3
MST	Mud Sample Temperature	49.00 DEGF
MWCO	Mud Weight Correction Option	NO
NIAV	HRDD Density/Pe Algorithm Version	1
NMT	HILT Nuclear Mud Type	NOBARITE
NPRM	HRDD Processing Mode	StdRes
NSAR	HRDD Depth Sampling Rate	1 IN
PTCO	Pressure/Temperature Correction Option	NO
RMFS	Resistivity of Mud Filtrate Sample	2.3700 OHMM
SDAT	Standoff Data Source	SOCN
SHT	Surface Hole Temperature	49 DEGF
SOCN	Standoff Distance	0.125 IN
SOCO	Standoff Correction Option	YES

Format: PORO\_REP

Vertical Scale: 5" per 100'

Graphics File Created: 31-OCT-1996 18:30

### OP System Version: 7C0-427 DBM

HILTB-CTS	RPCVX-680	ALLRES	RPCVX-680
HOLEV	RPCVX-680	PERT	RPCVX-680

### Input DLIS Files

DEFAULT	HILTC .003	FN:2	FIELD	31-OCT-1996 18:02	6534.0 FT	6098.5 FT
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### Output DLIS Files

DEFAULT	HILTC .004	FN:3	FIELD	31-OCT-1996 18:30	
REDUCED	HILTC .004	FN:4	CUST	31-OCT-1996 18:30	

### Output DLIS Files

DEFAULT	HILTC .004	FN:3	FIELD	31-OCT-1996 18:30
REDUCED	HILTC .004	FN:4	CUST	31-OCT-1996 18:30

### Integrated Hole/Cement Volume Summary

Hole Volume = 2179.93 F3

Cement Volume = 1173.97 F3 (assuming 5.50 IN casing O.D.)

# OP System Version: 7C0-427

DBM

HILTB-CTS  
HOLEVRPCVX-680  
RPCVX-680ALLRES  
PERTRPCVX-680  
RPCVX-680**PIP SUMMARY**

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
  - Integrated Cement Volume Minor Pip Every 10 F3
  - Integrated Cement Volume Major Pip Every 100 F3

 Time Mark Every 60 S**Tension (TENS)**

10000

(LBF)

0

**MAIN PASS****Density Correction (HDRA)**

-0.25

(G/C3)

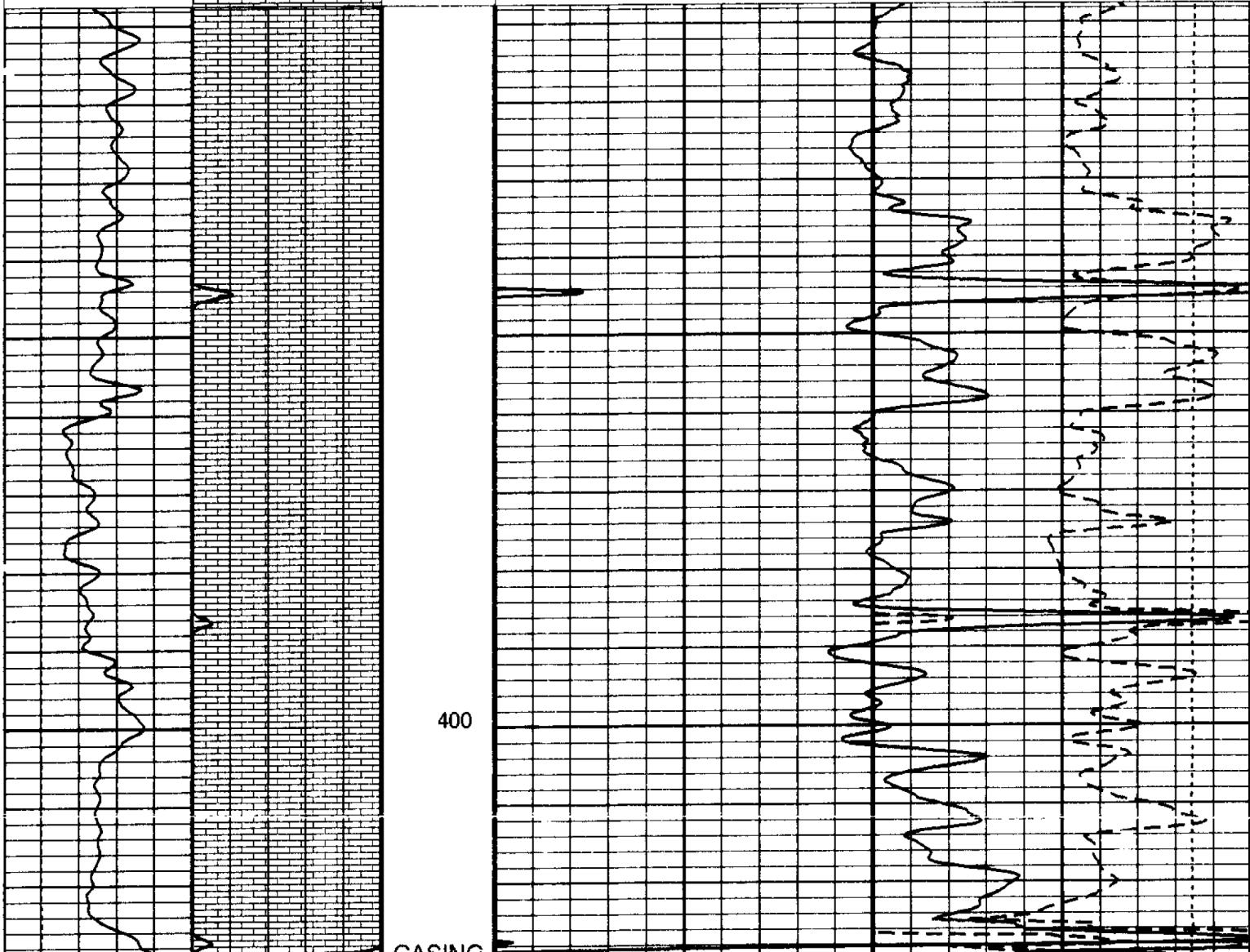
0.25

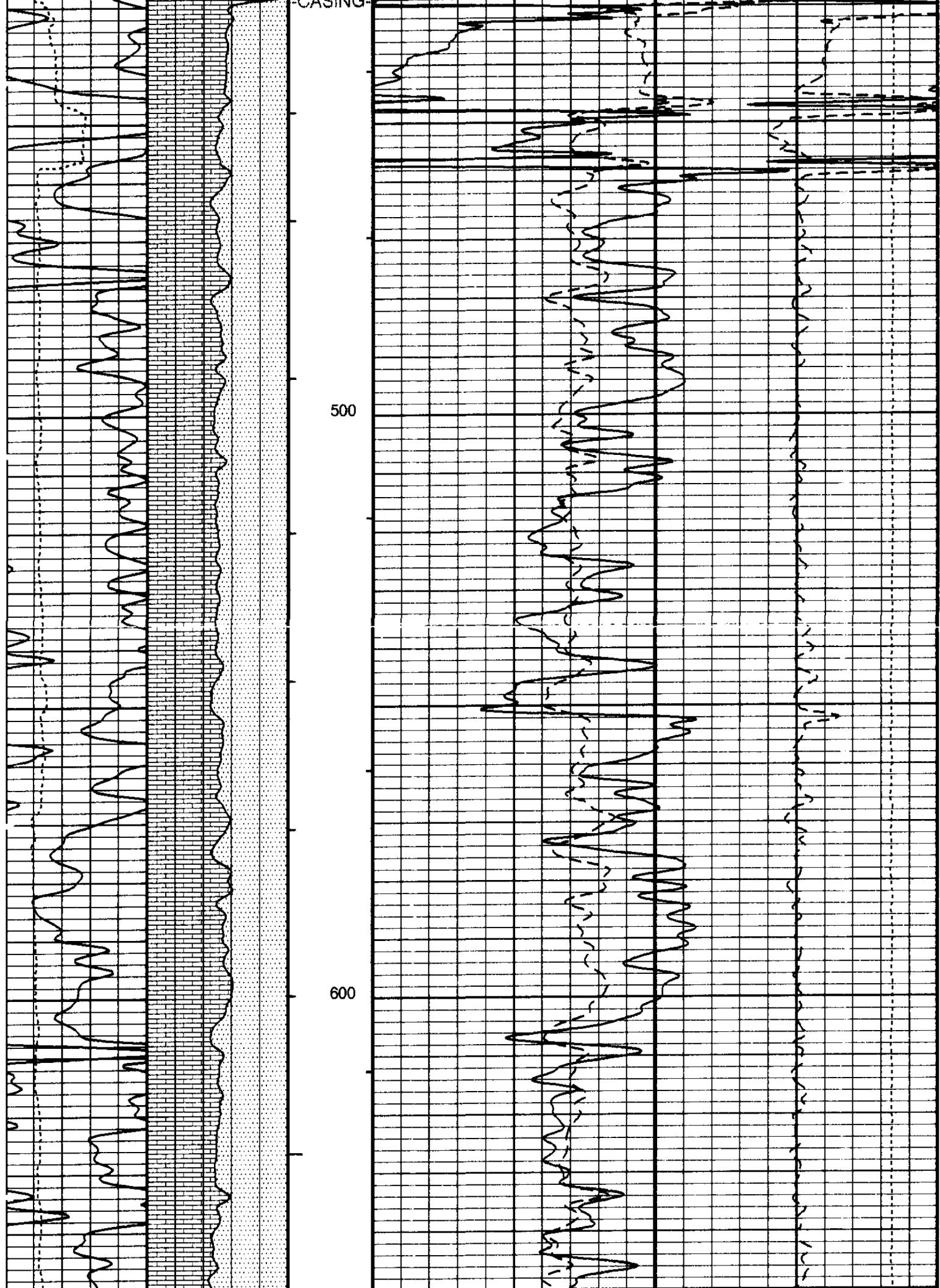
Dolomite/Shale  
From RHT1 to  
MP3Caliper (HCAL)  
6 (IN) 16Quartz  
From MP2 to  
RHT1Tool/Tot.  
Drag  
From D3T  
to STIAStd. Res. Formation Density (RHOZ)  
(G/C3)

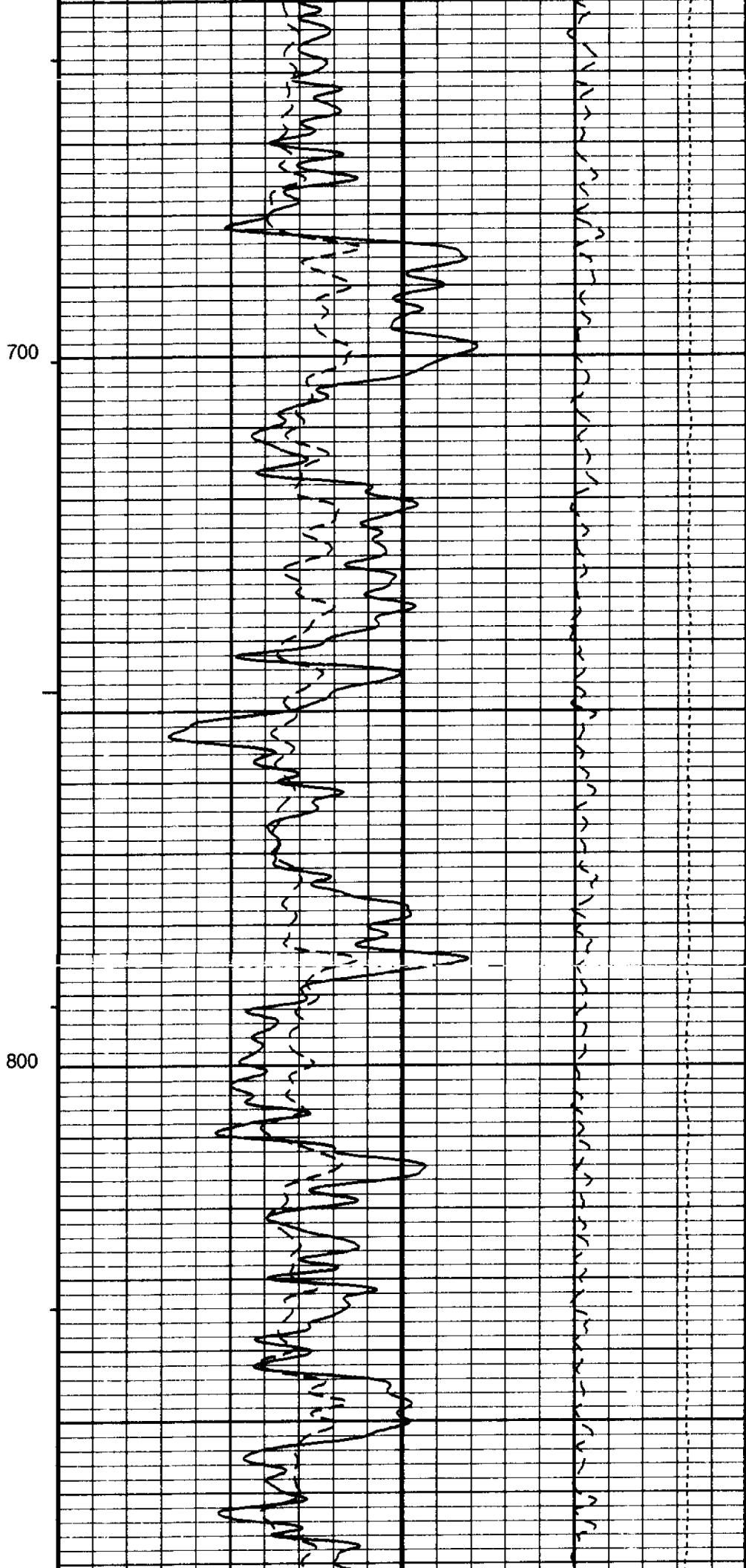
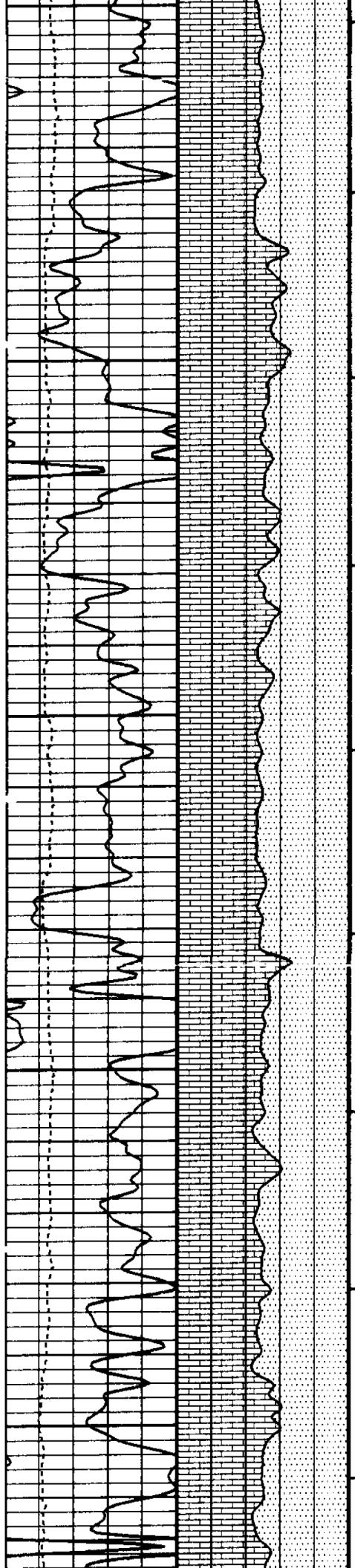
3

Gamma Ray (GR)  
0 (GAPI) 200Calcite  
From MP3 to MP2Stuck  
Stretch  
(STI)  
0 (F) 50Std. Res. Formation Pe (PEFZ)  
(---)

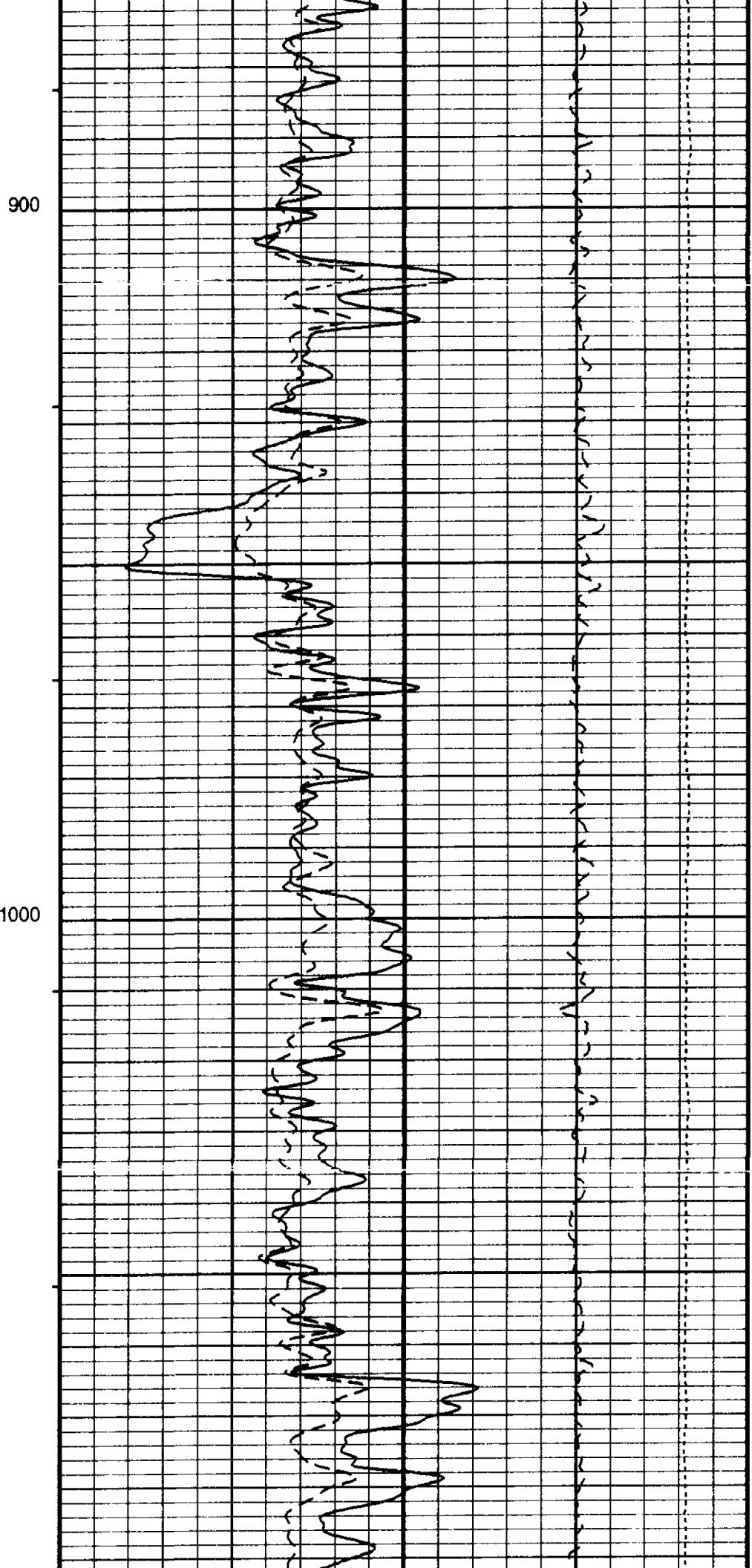
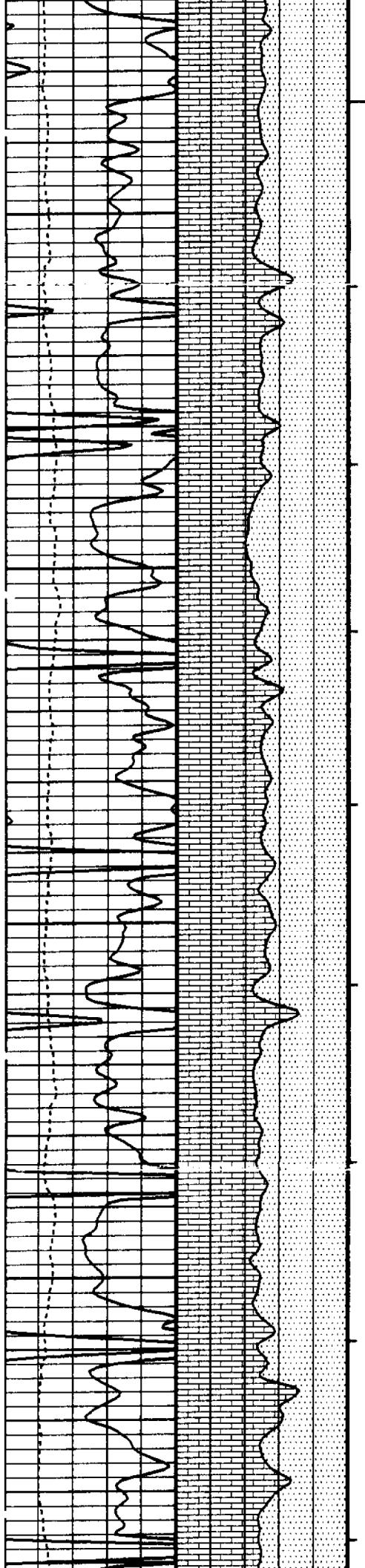
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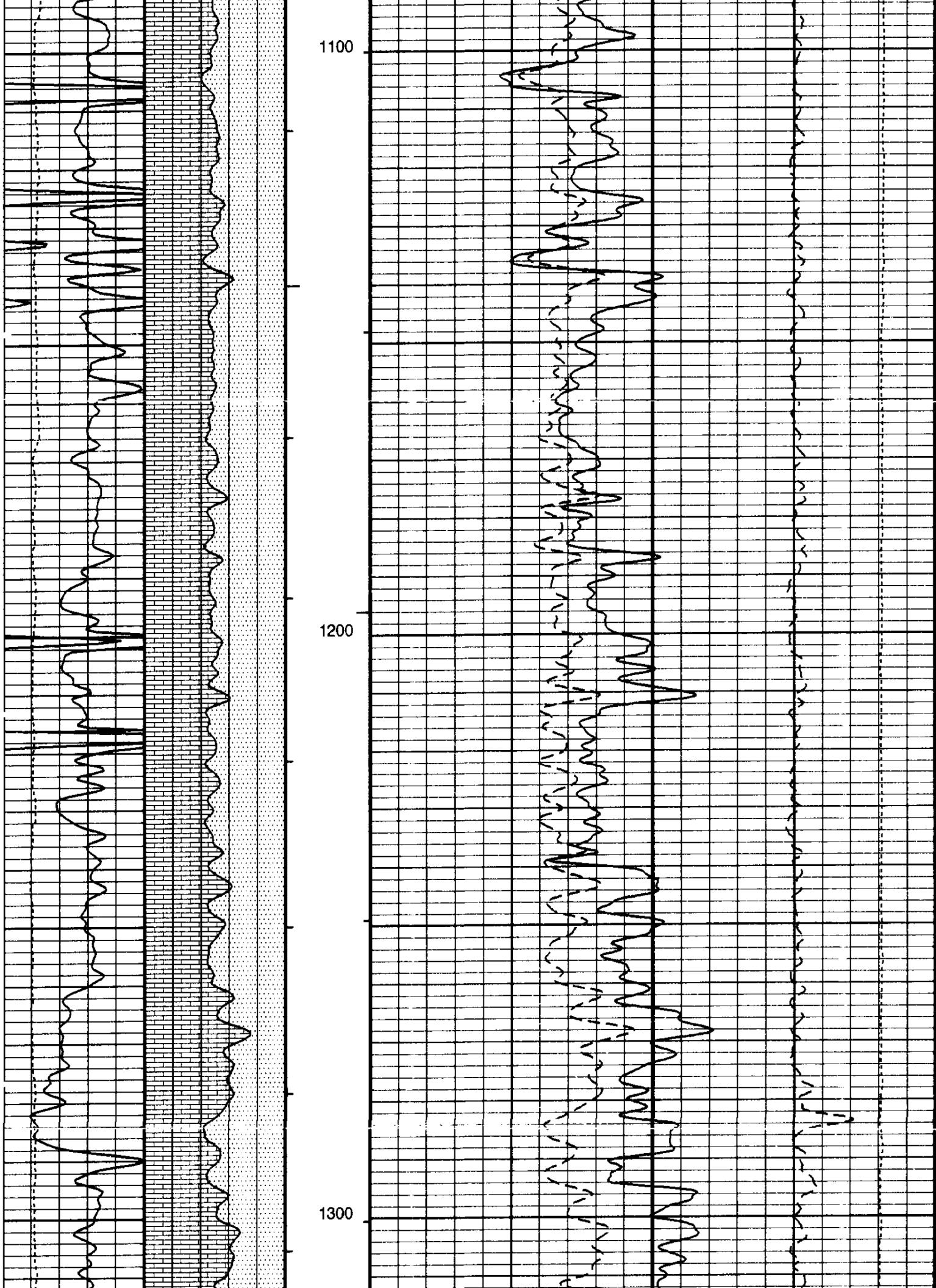


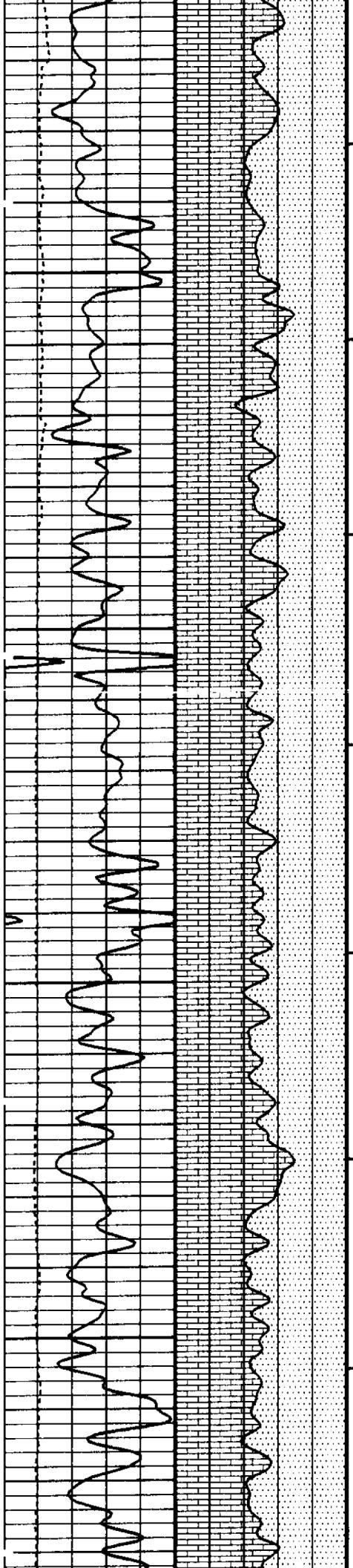




800

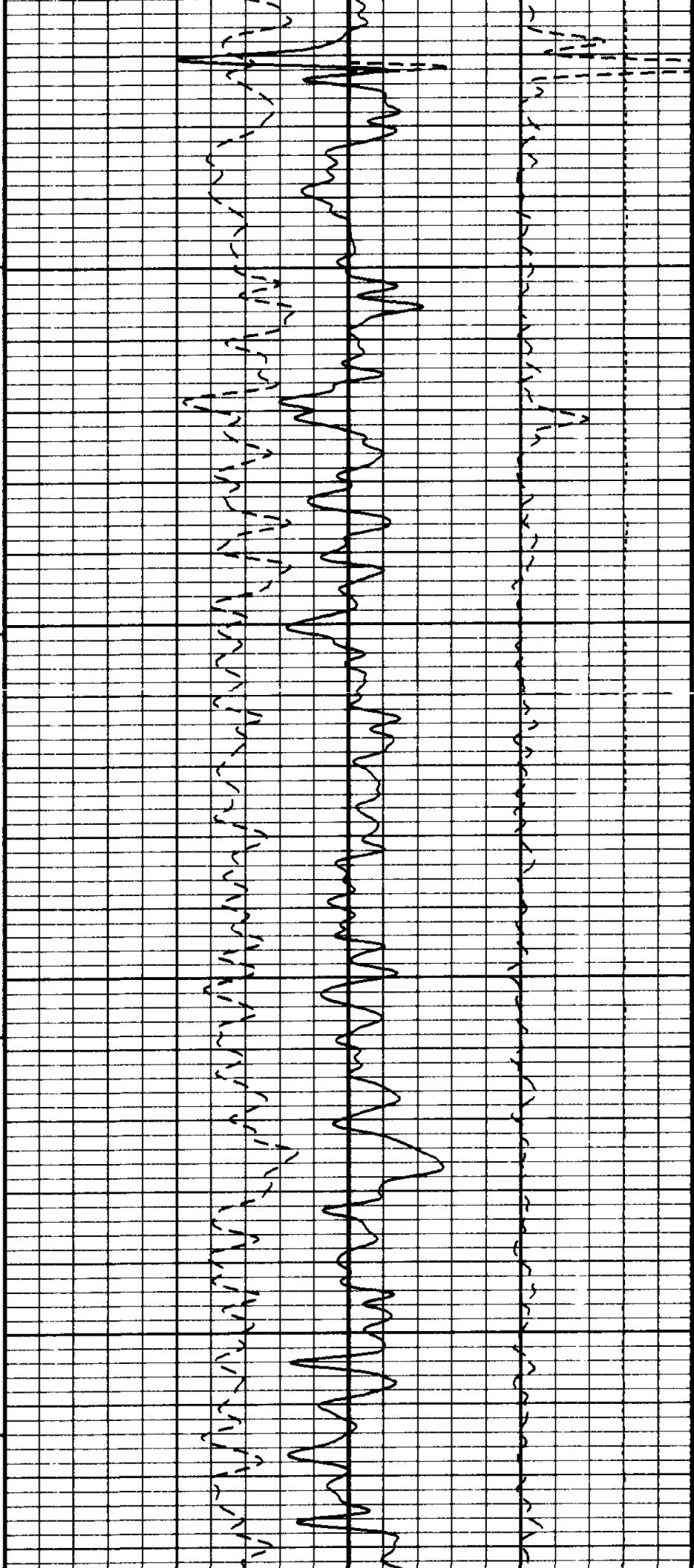


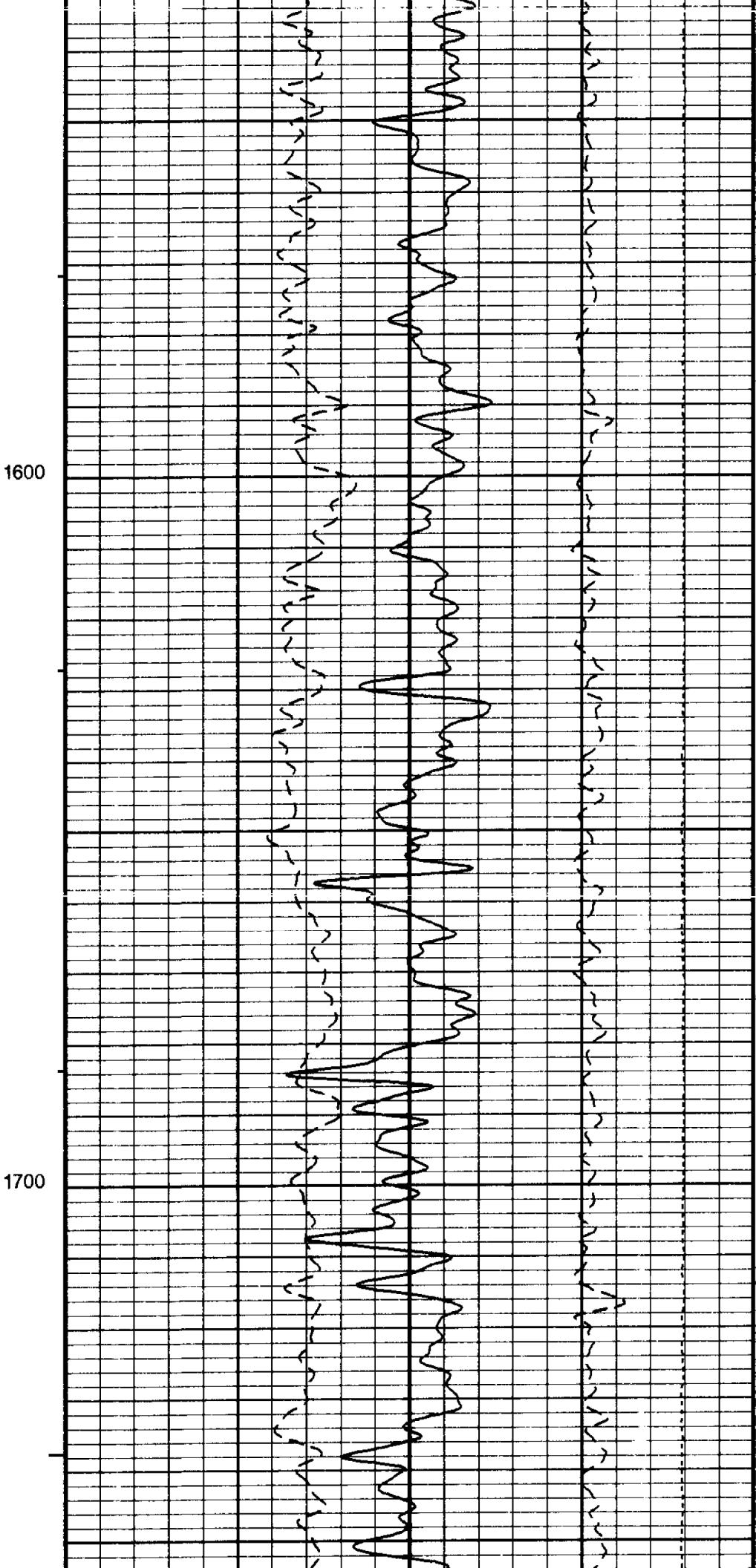
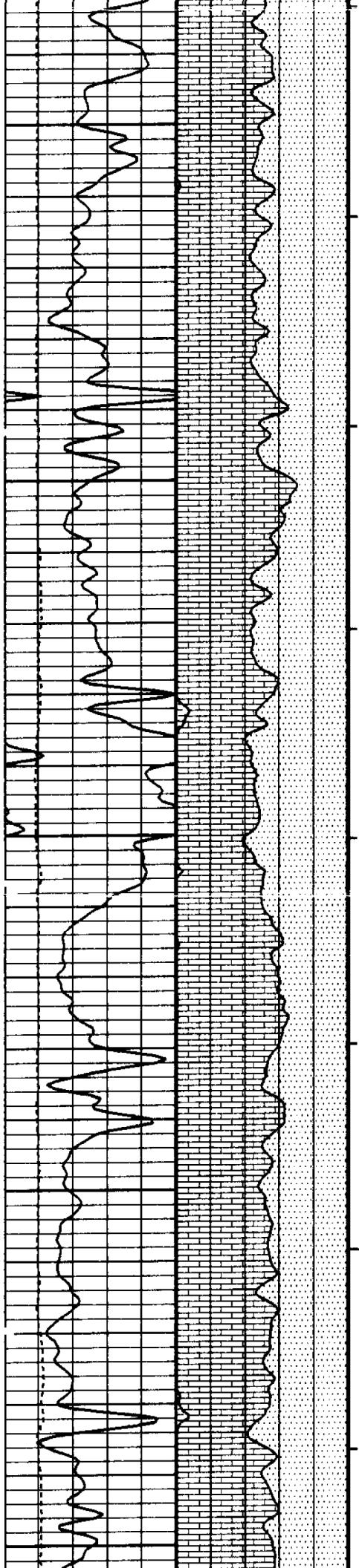


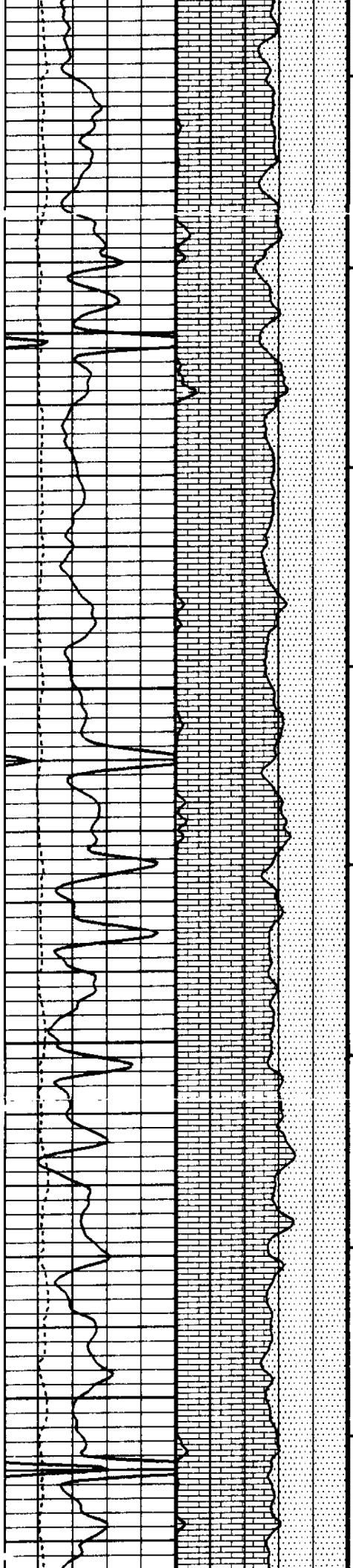


1400

1500

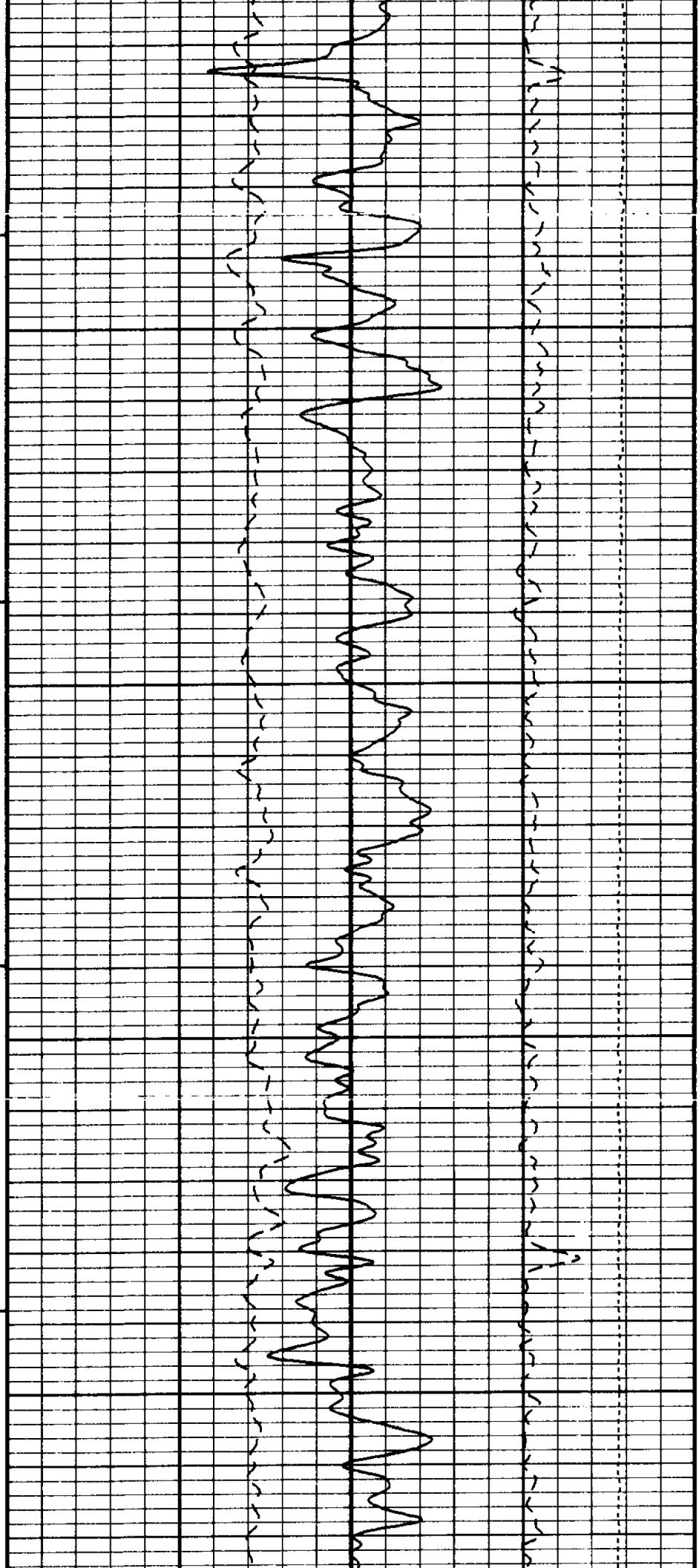


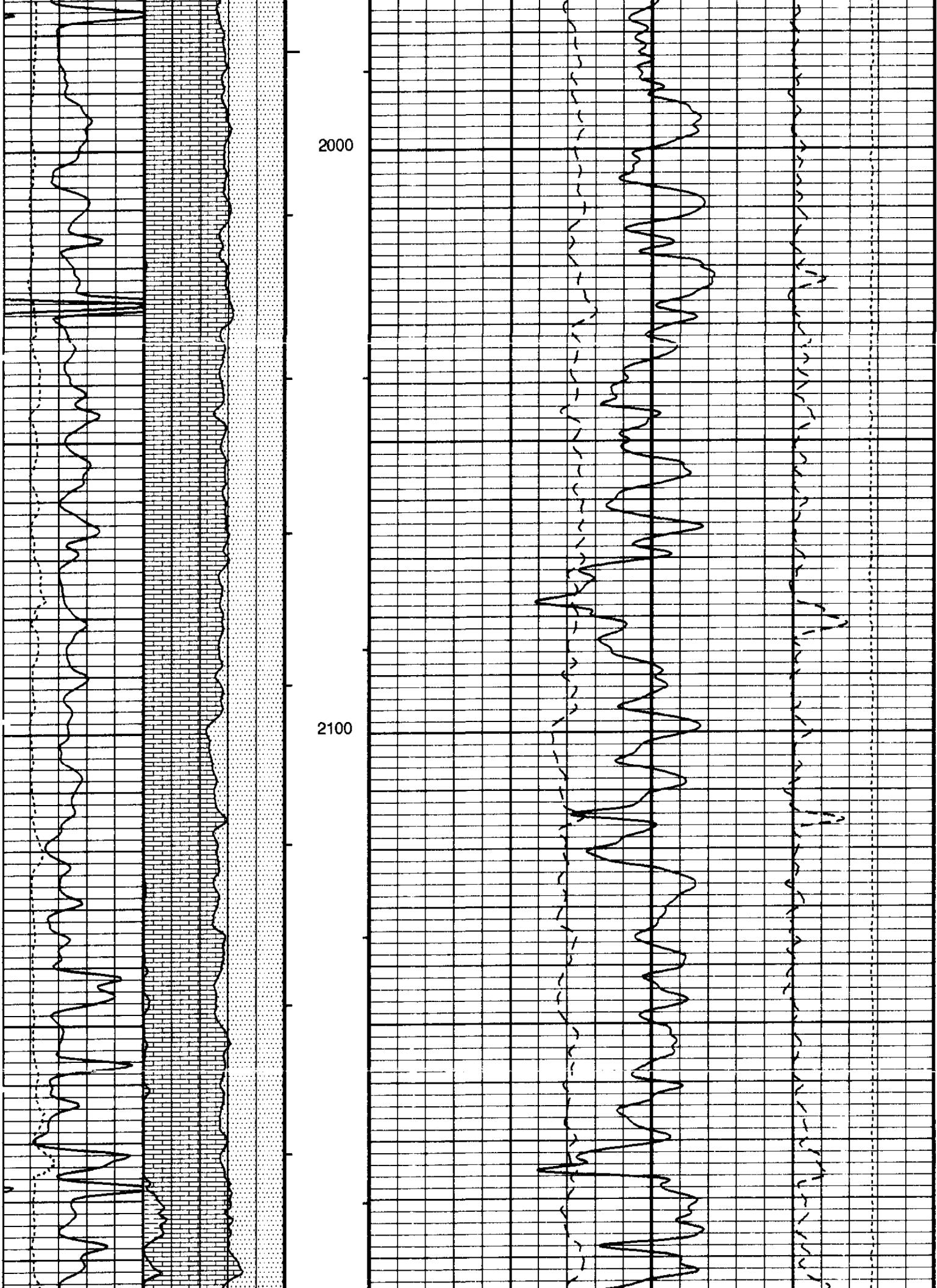


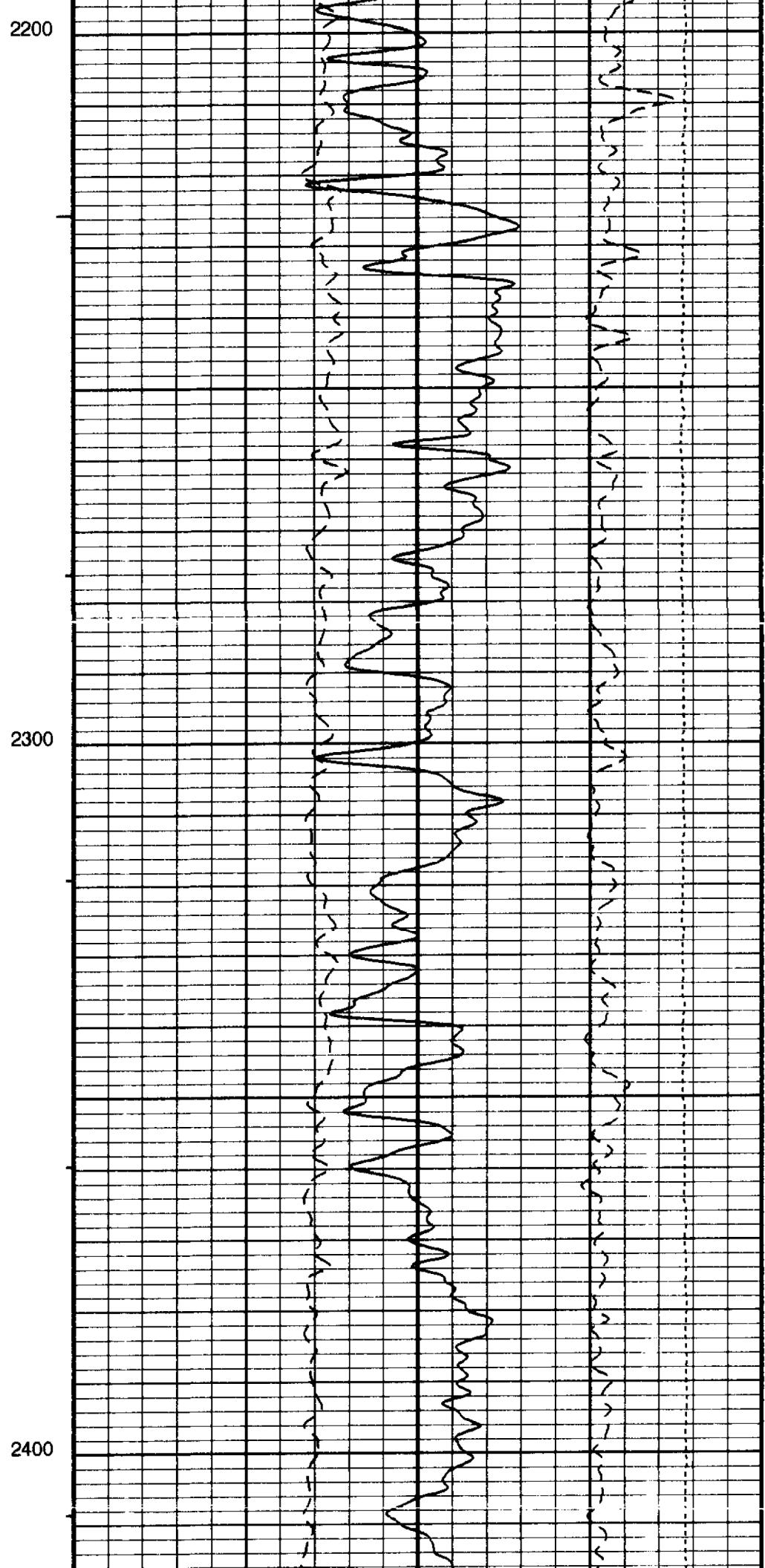
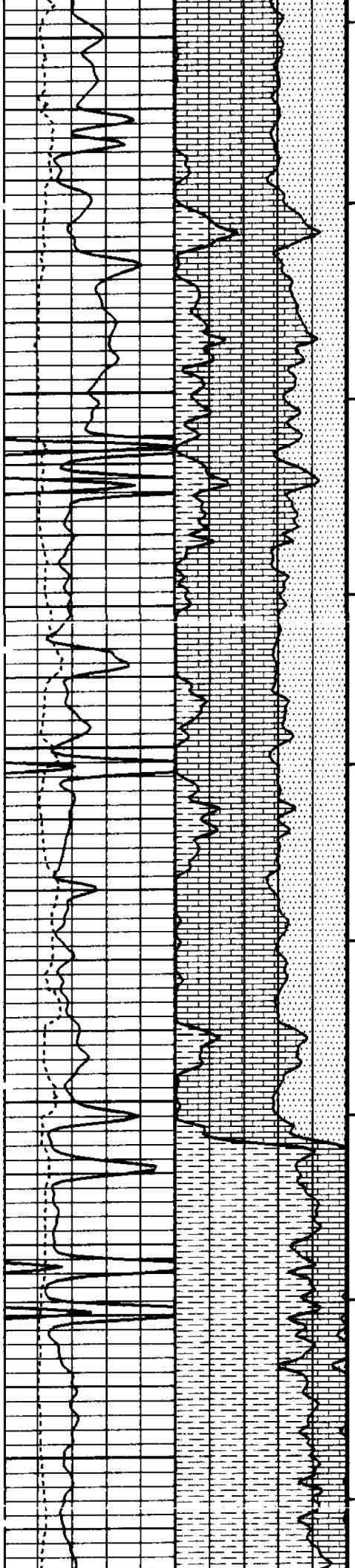


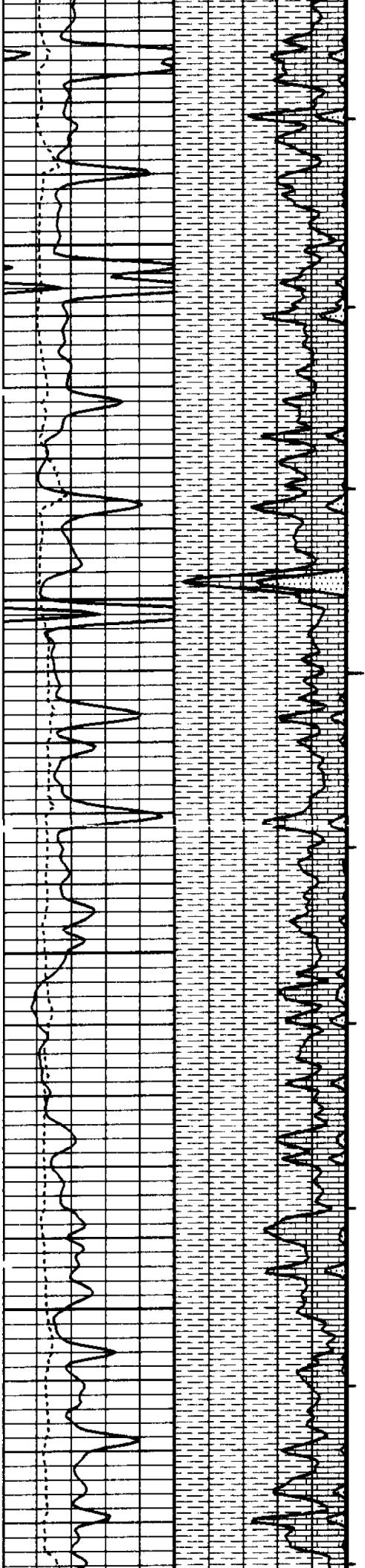
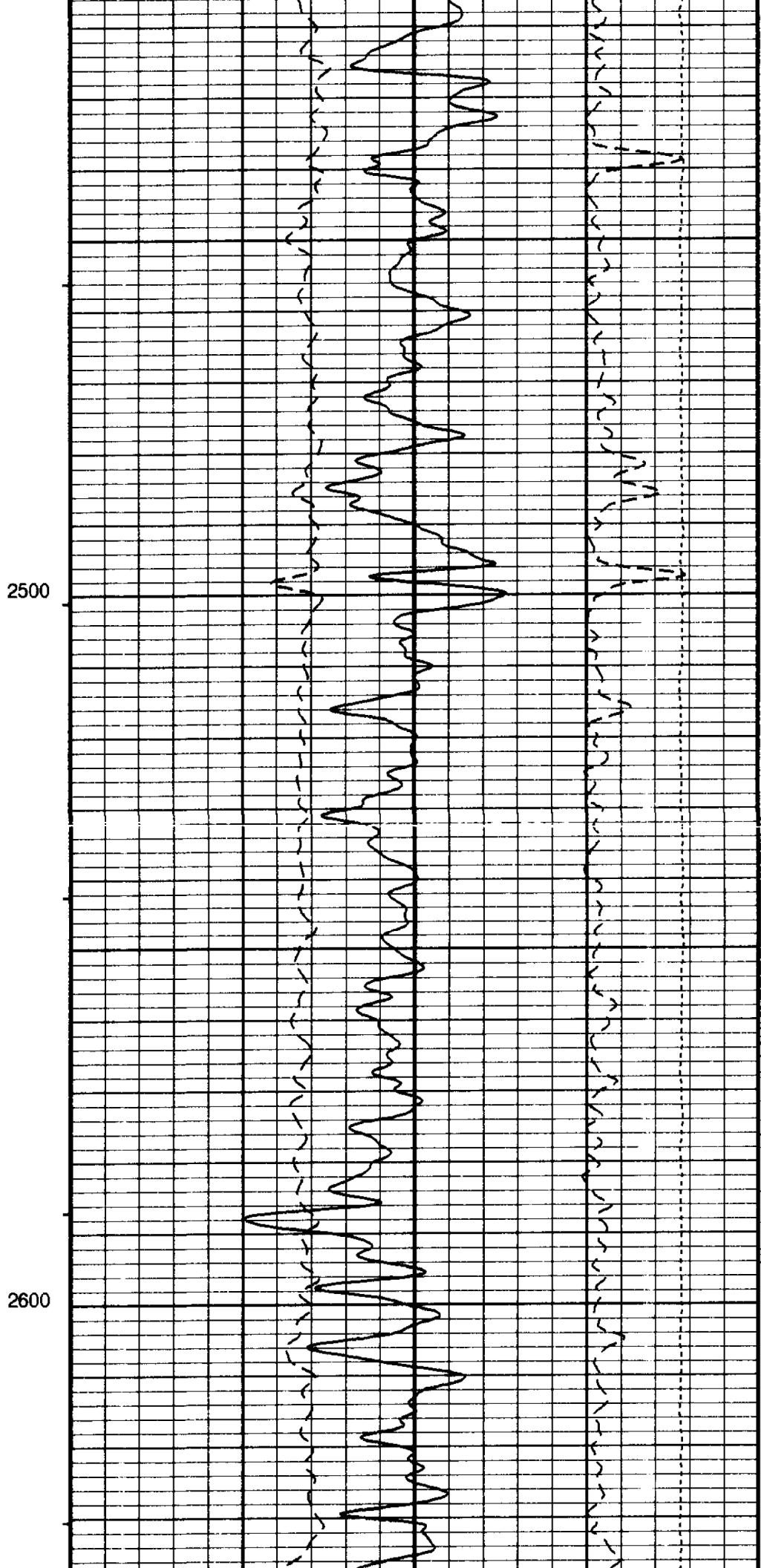
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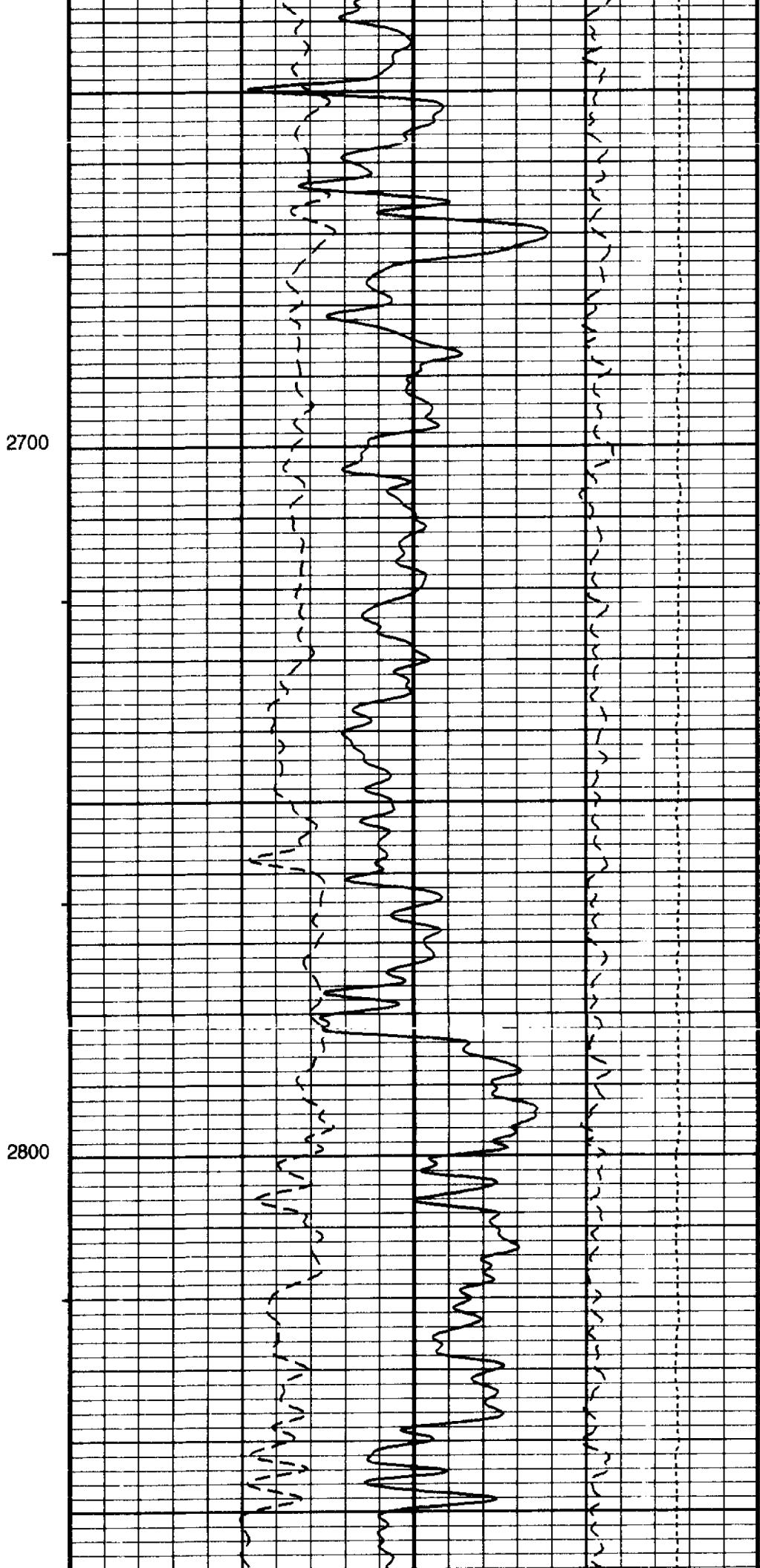
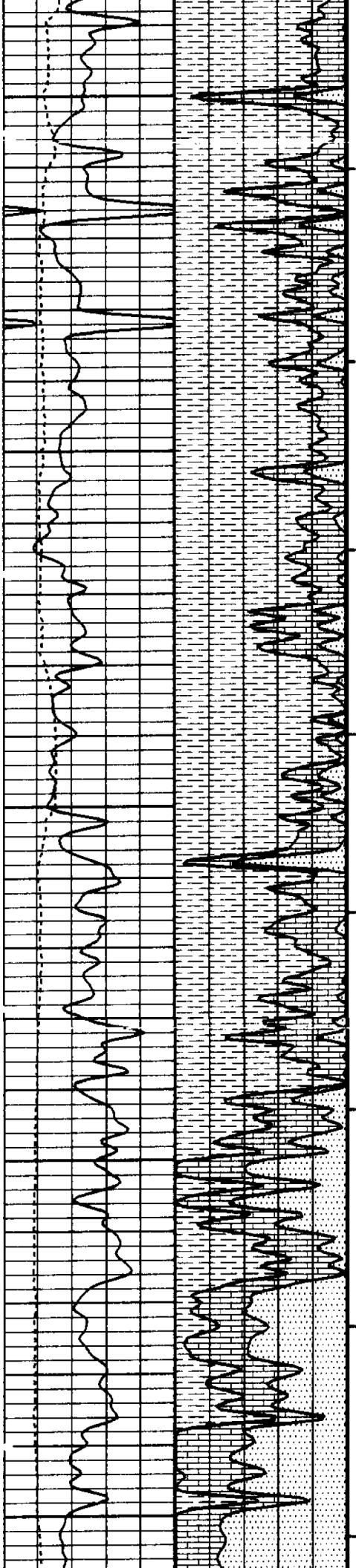
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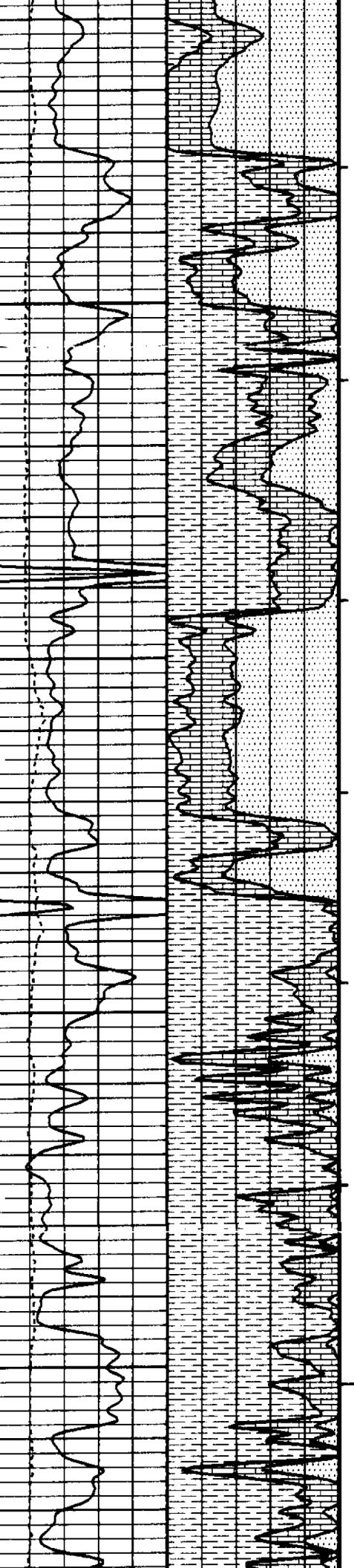






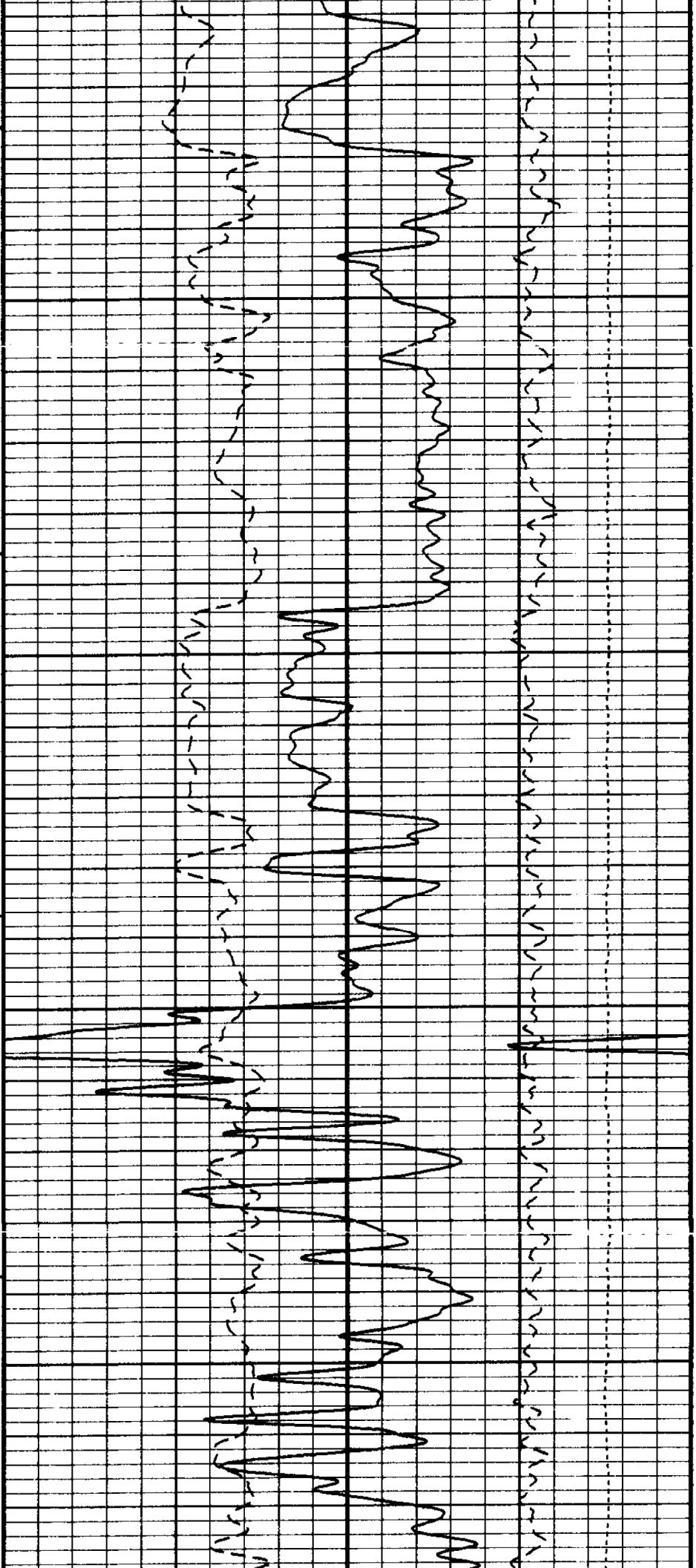


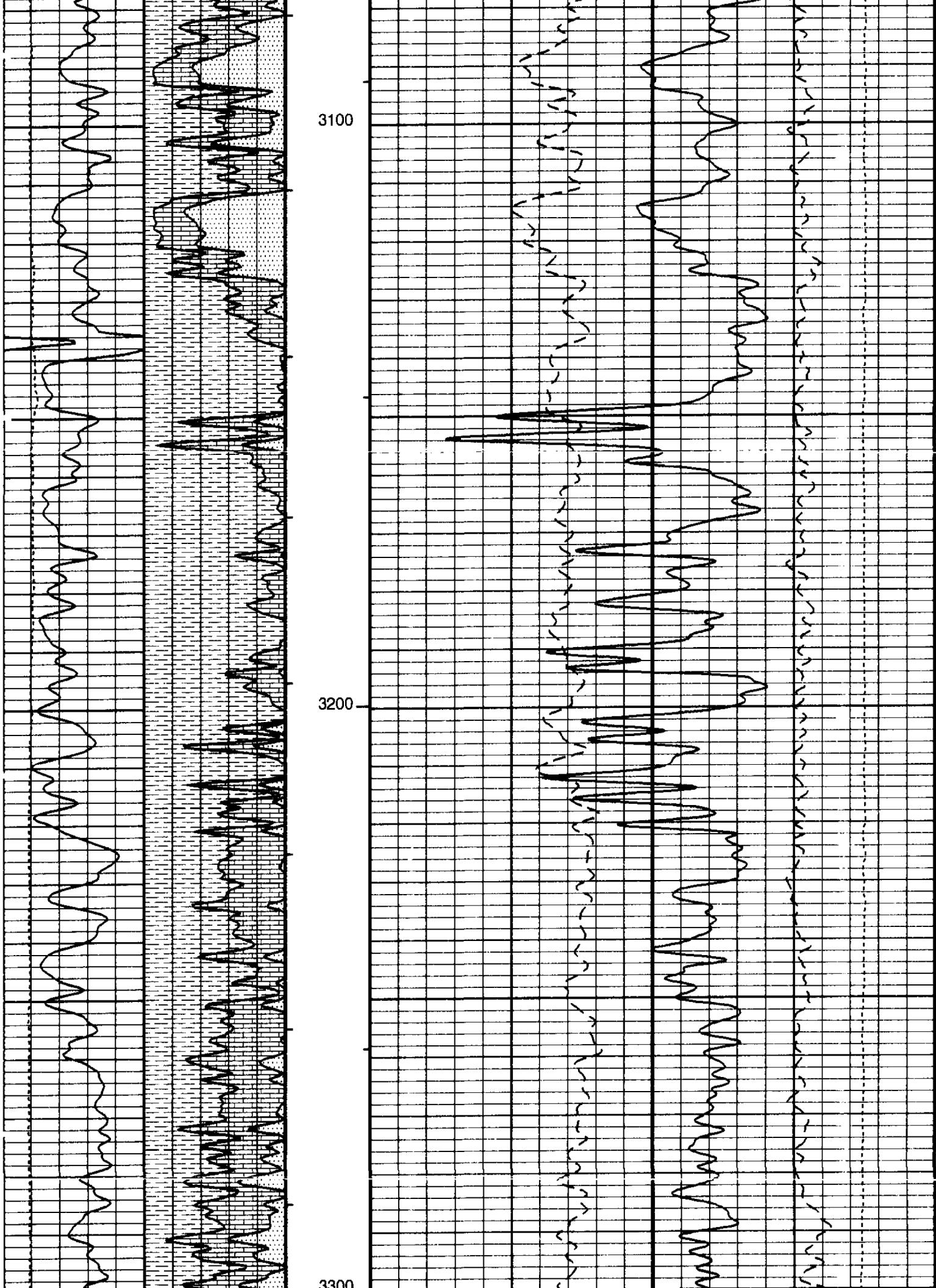


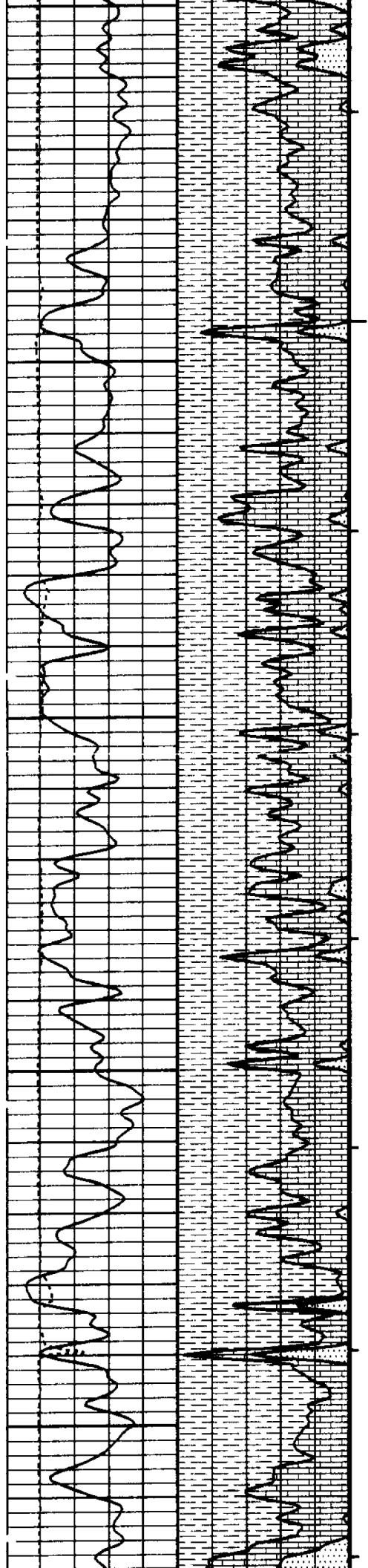
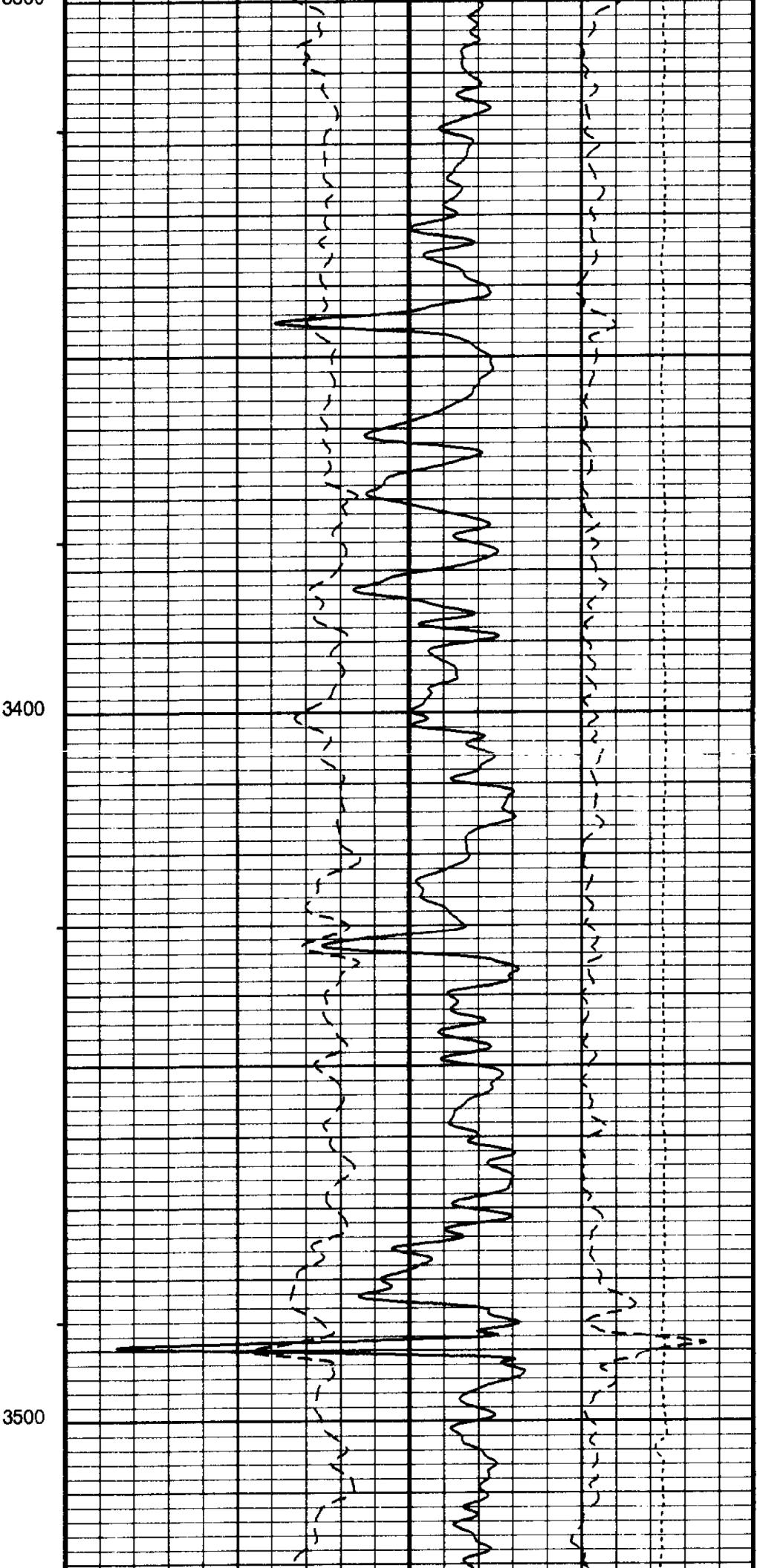


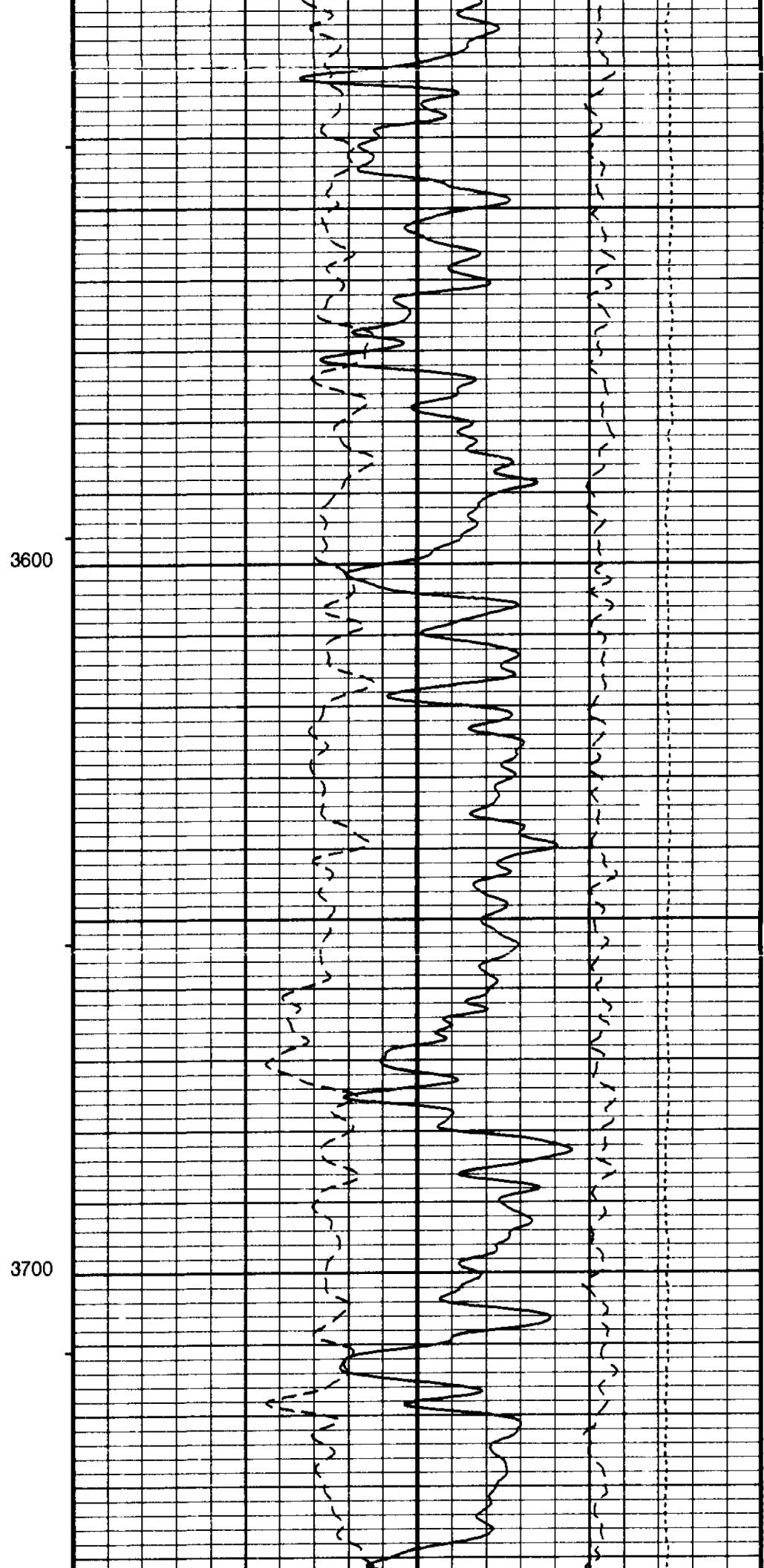
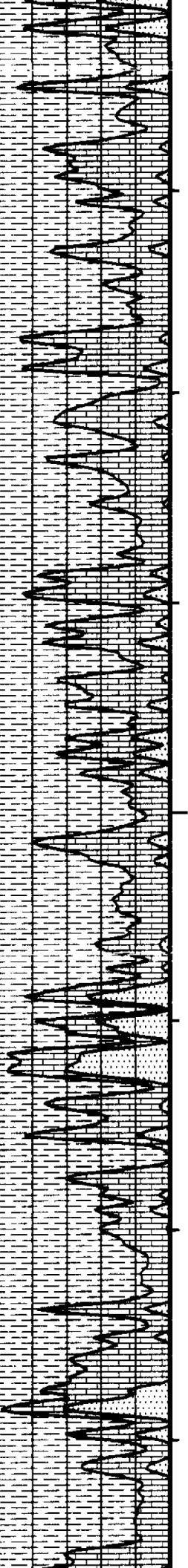
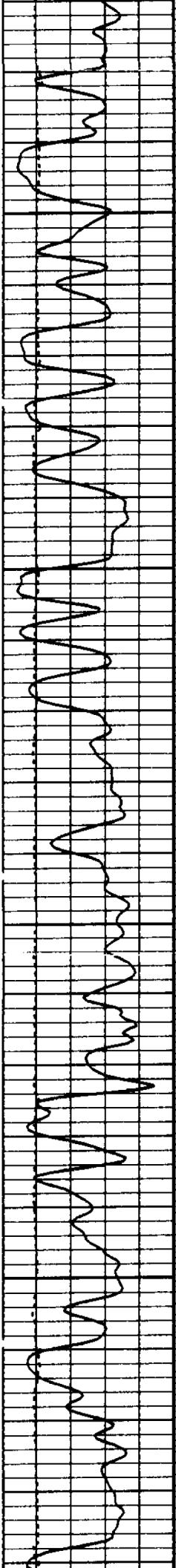
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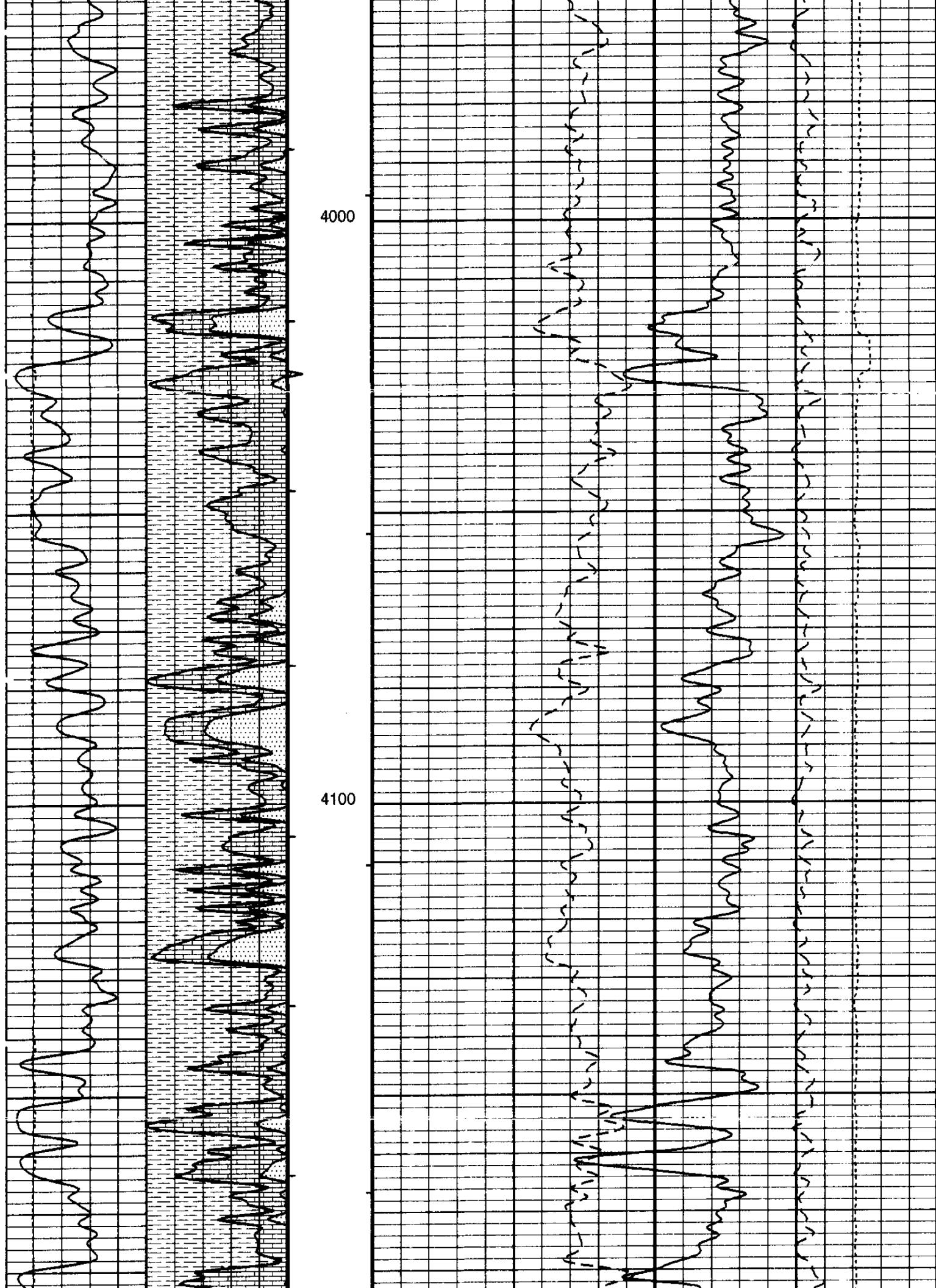


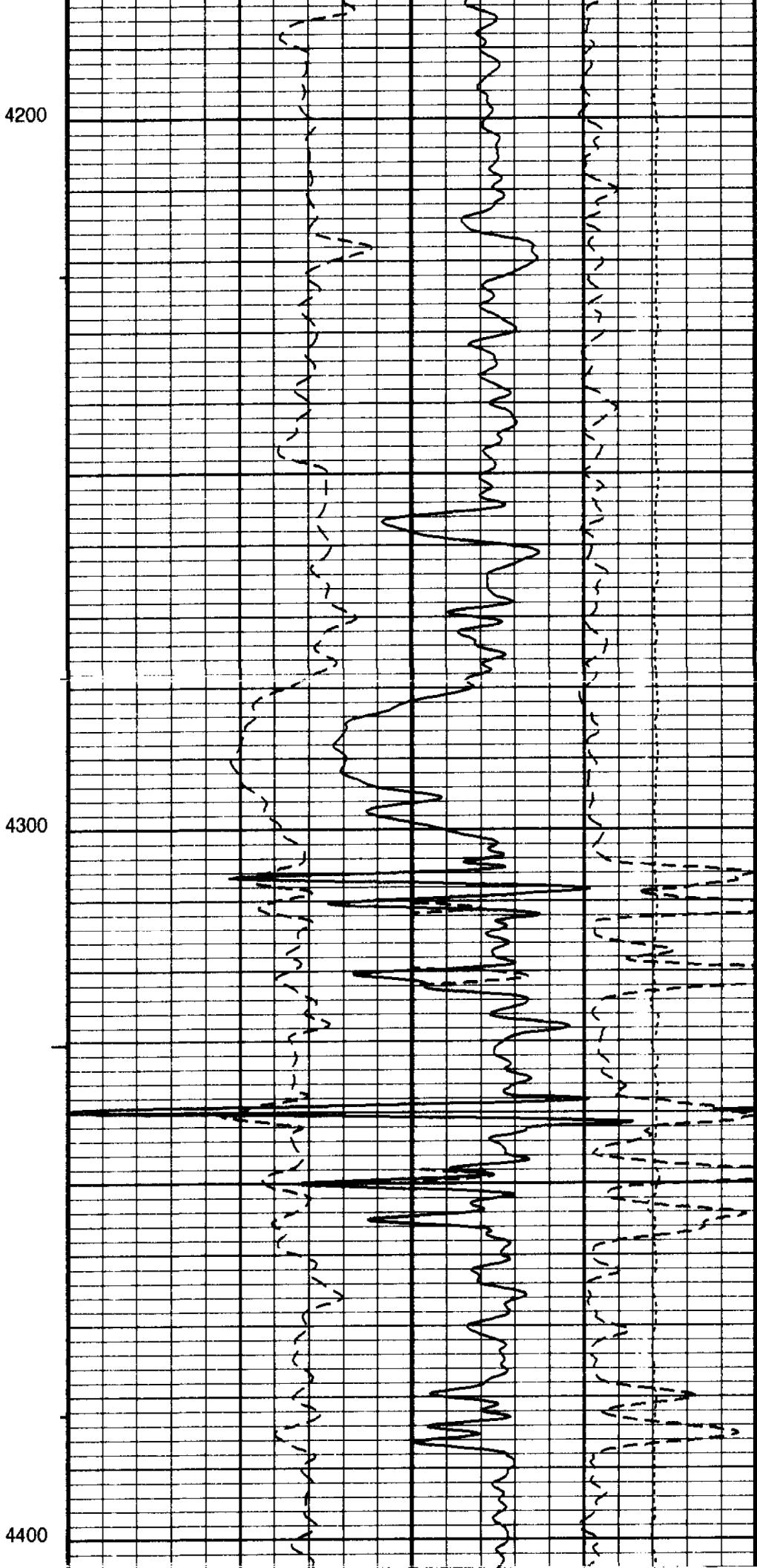
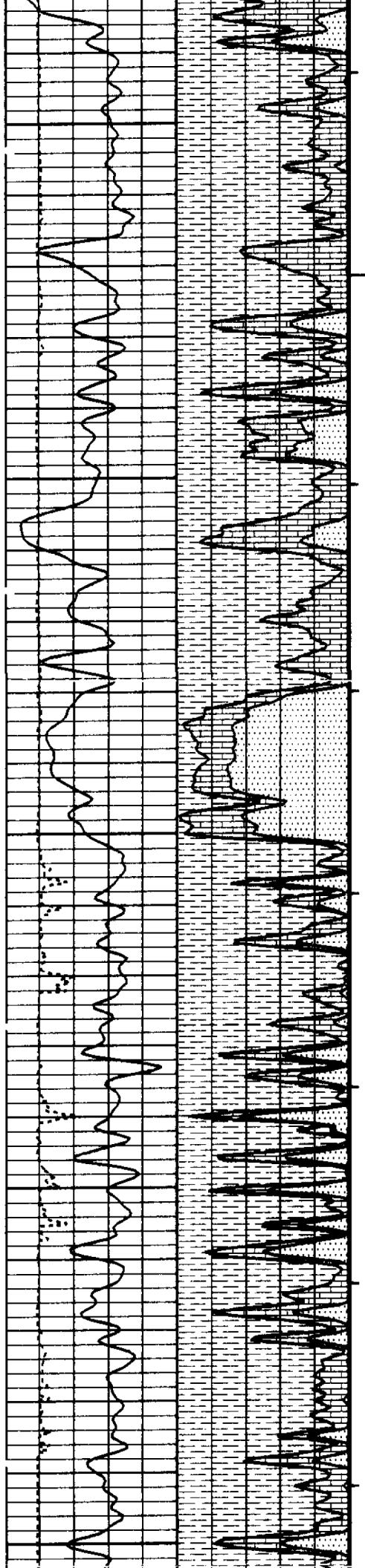


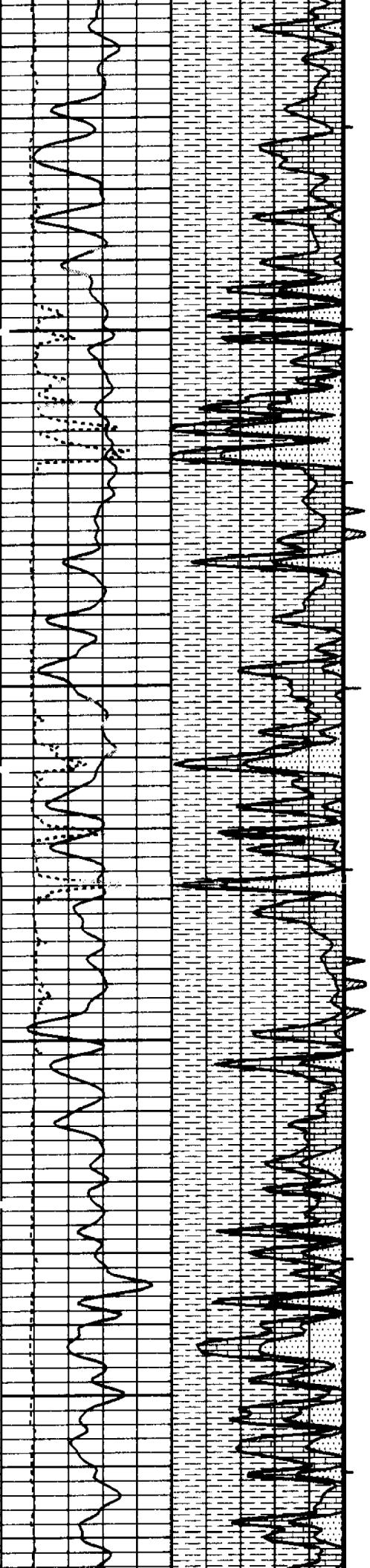


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3900

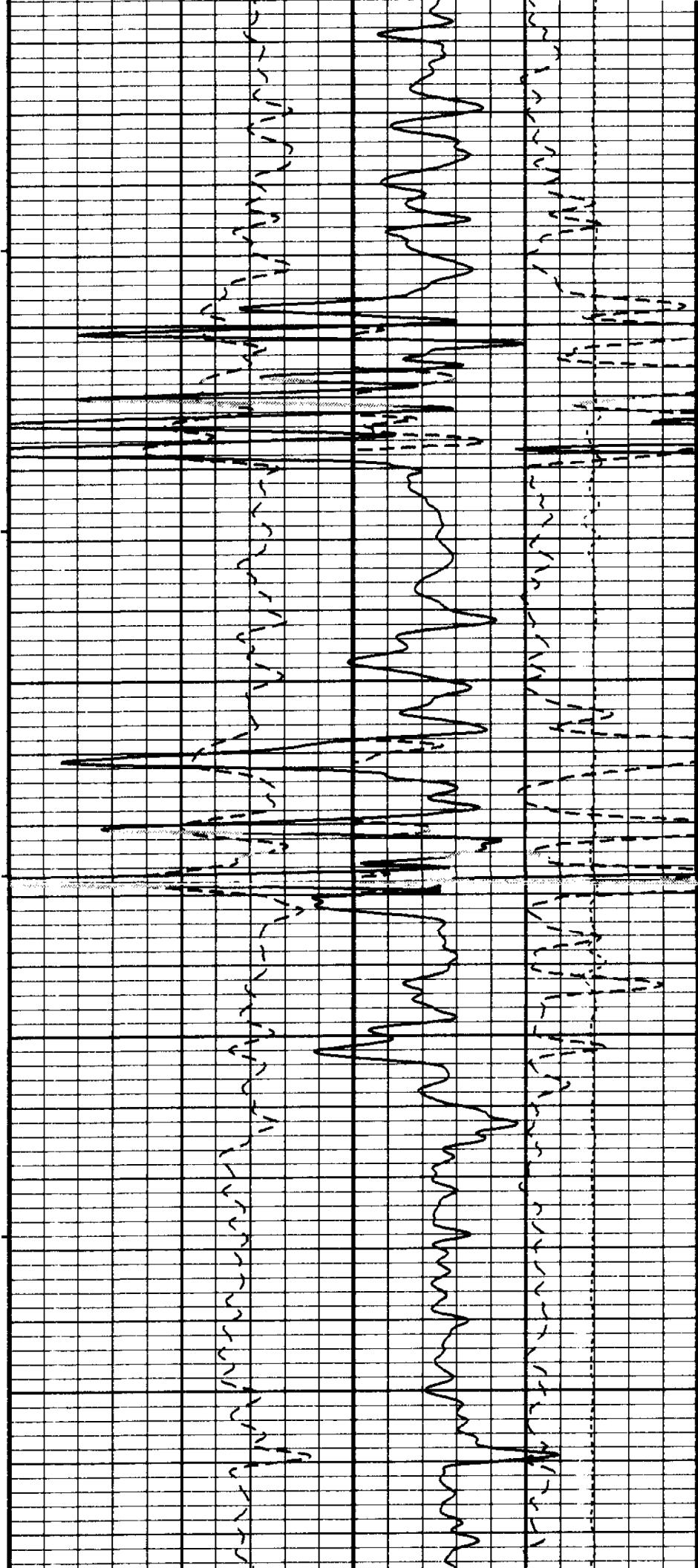






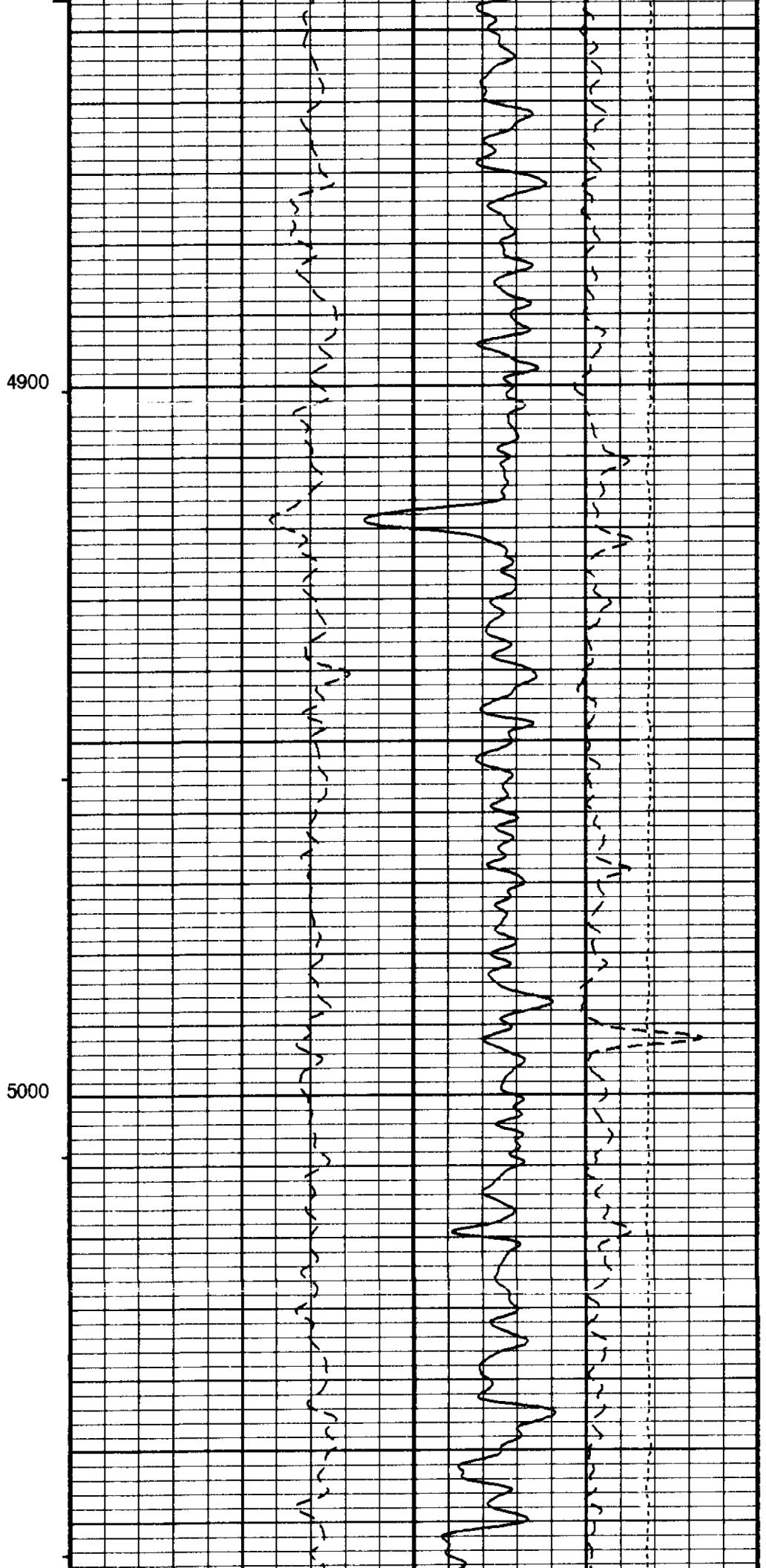
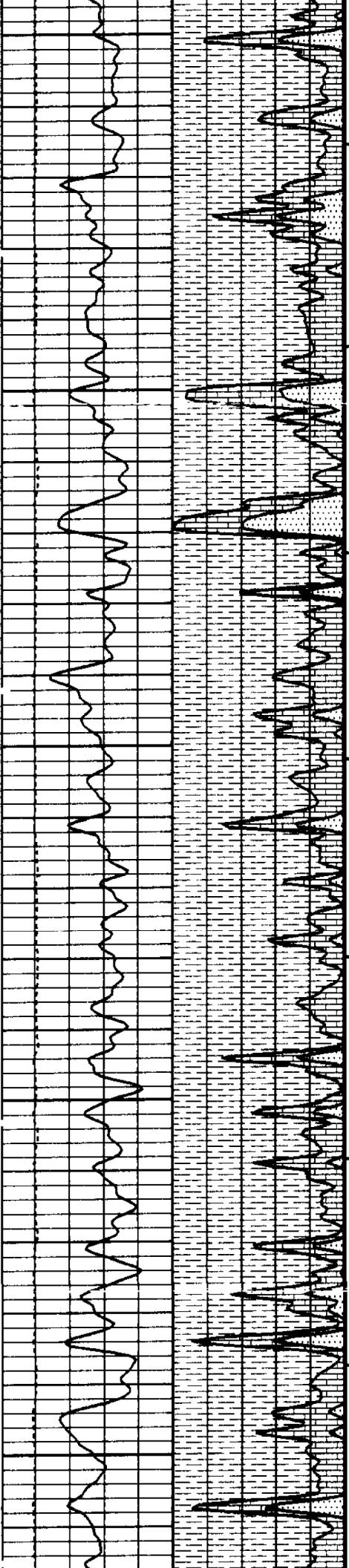
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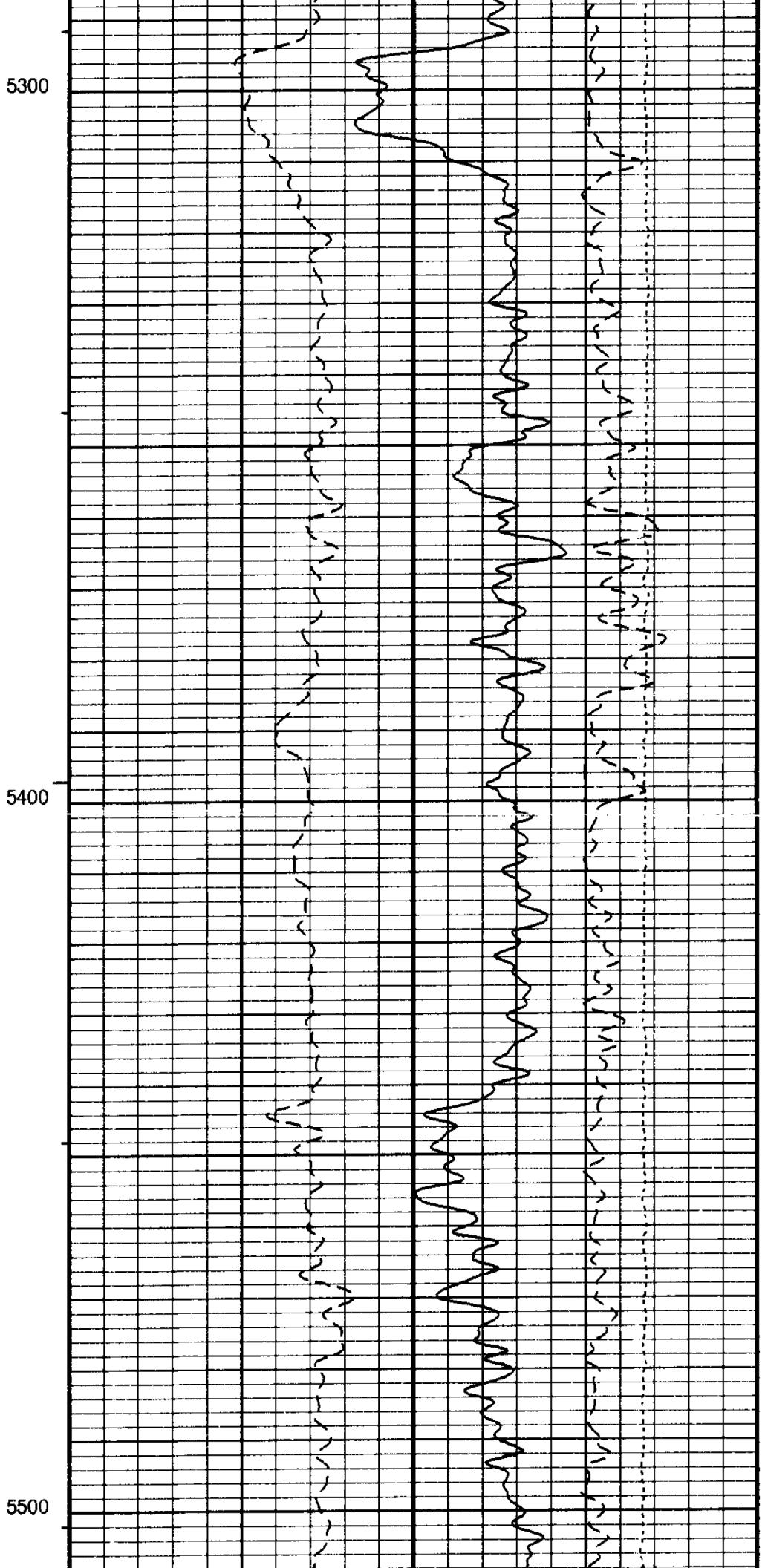
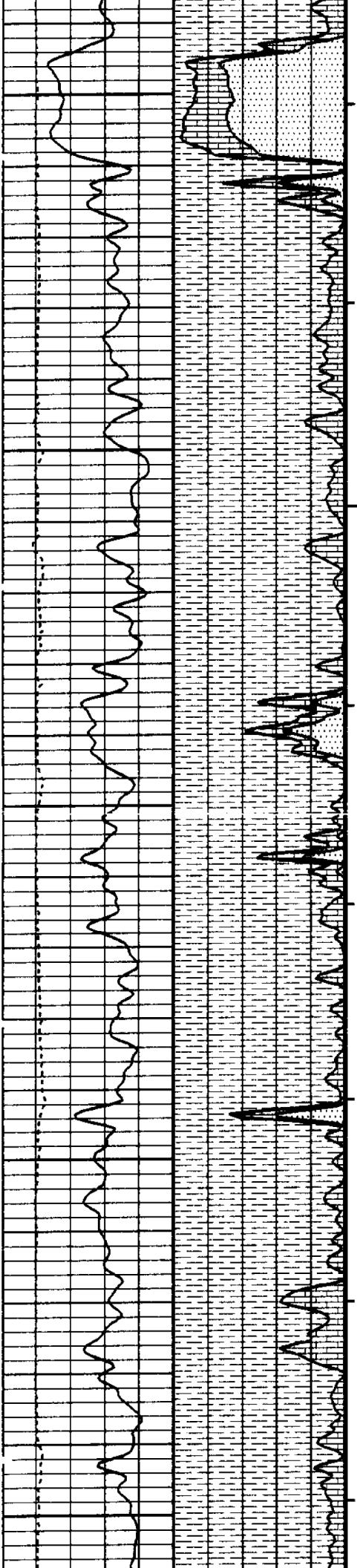
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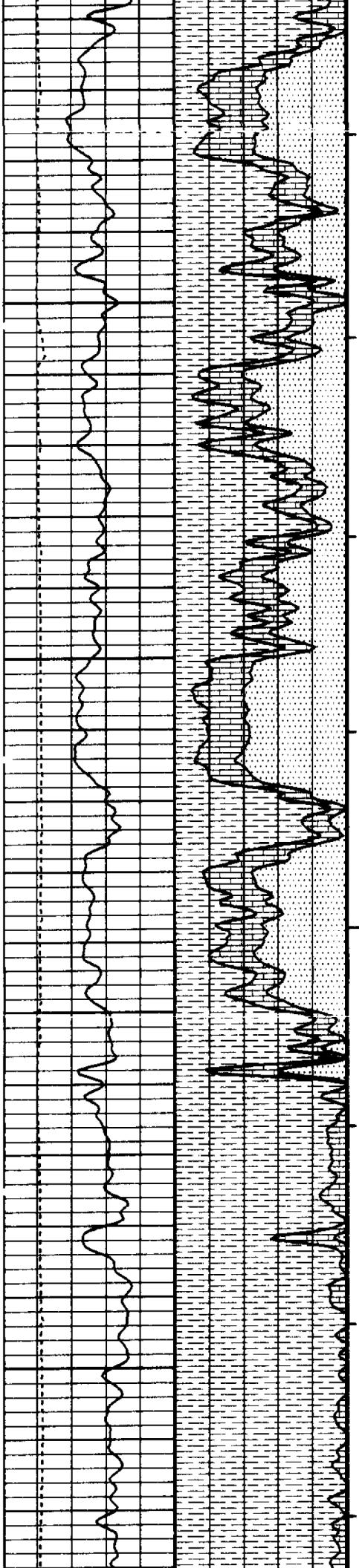
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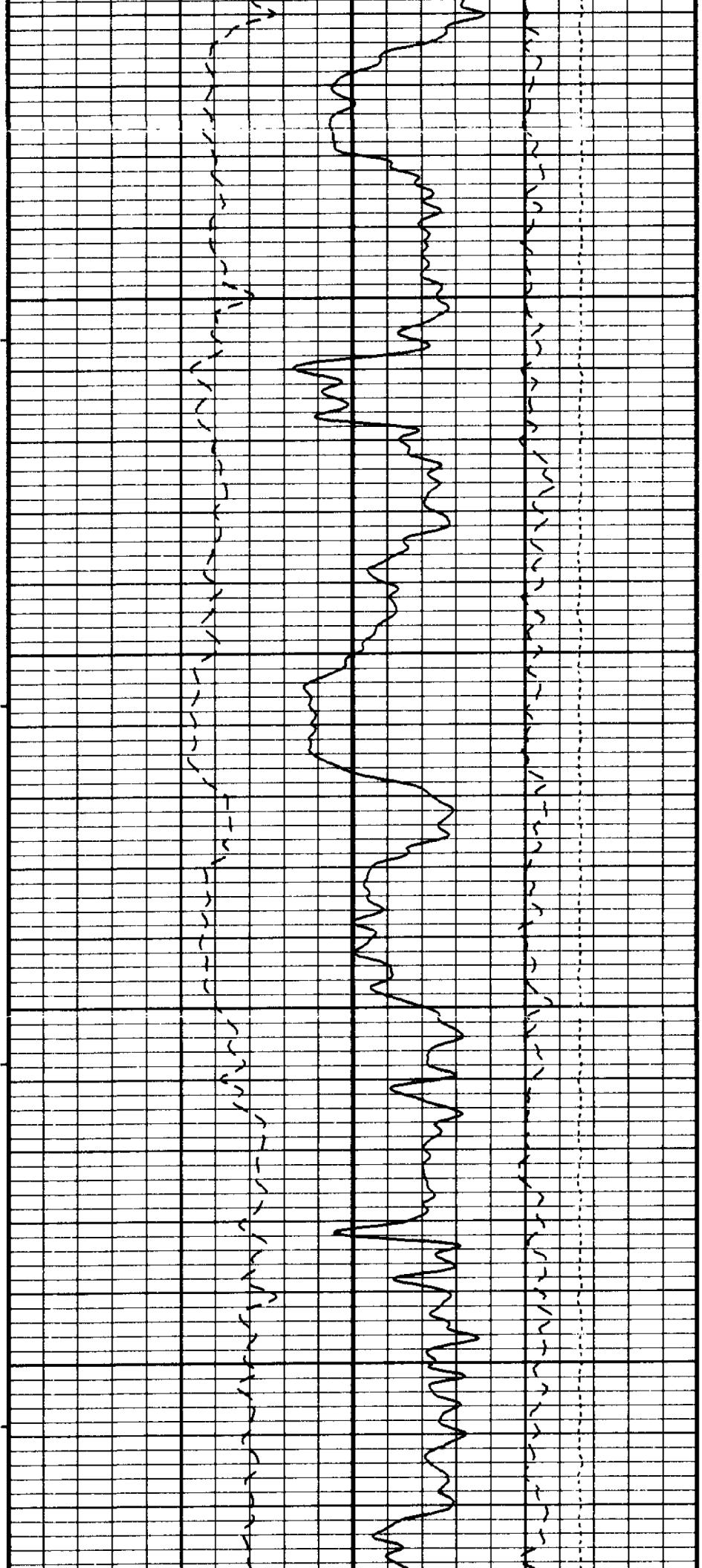
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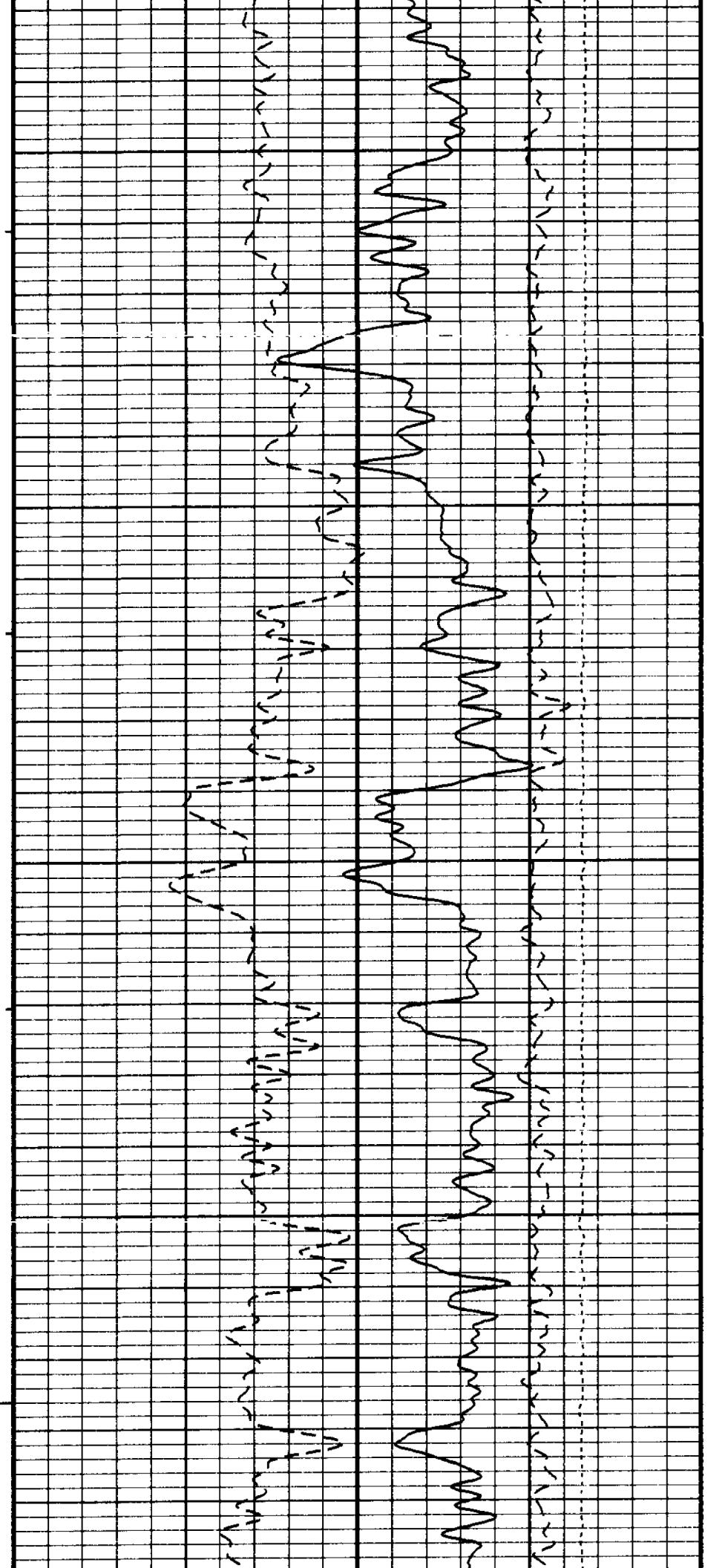
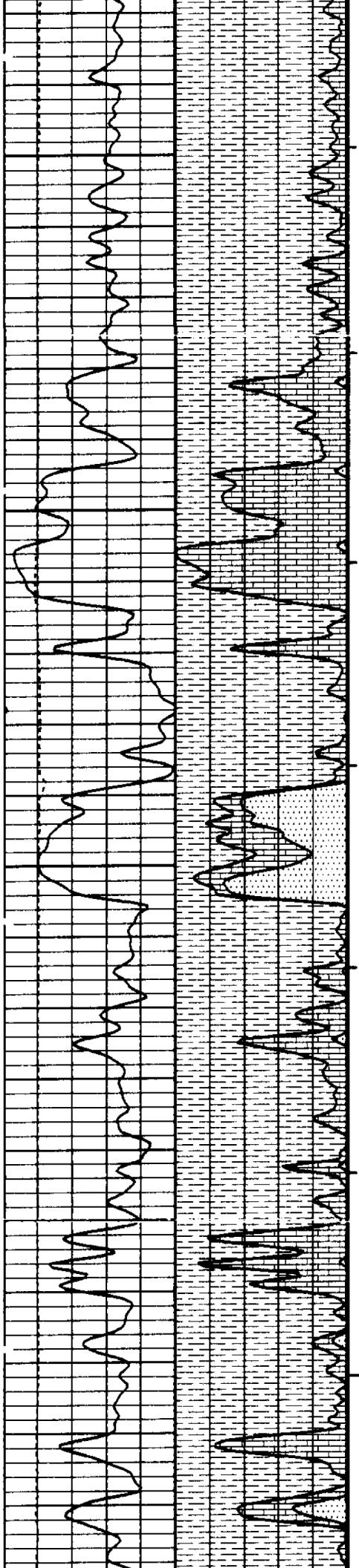


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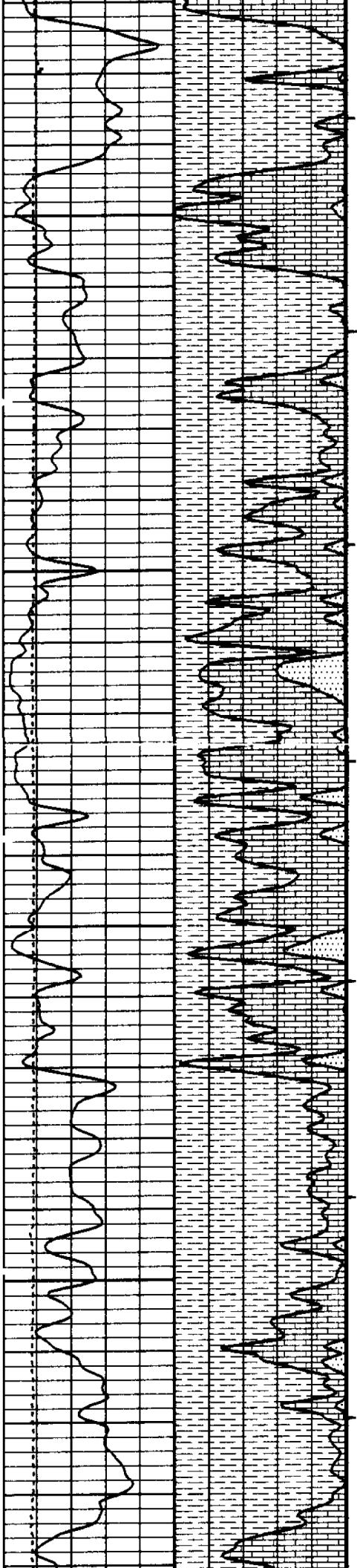
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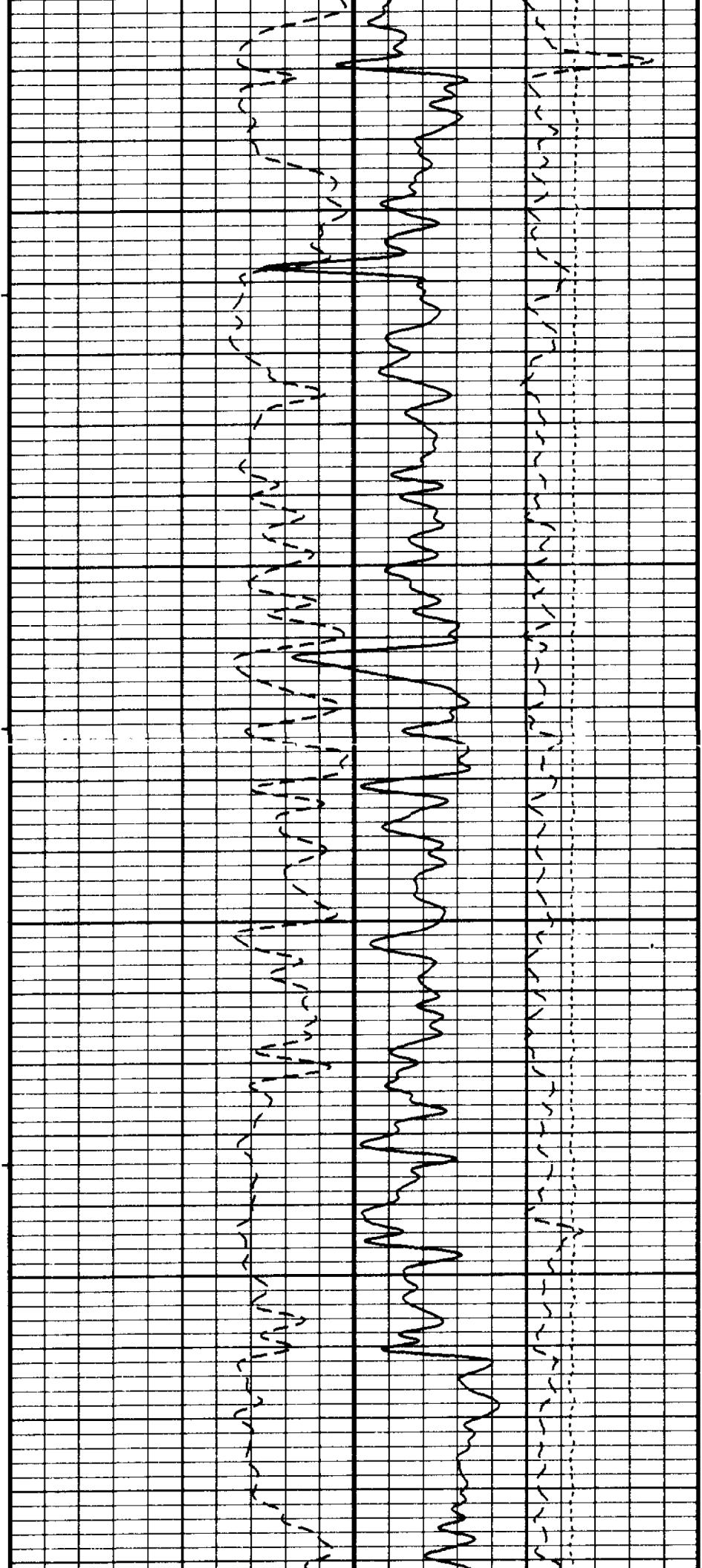
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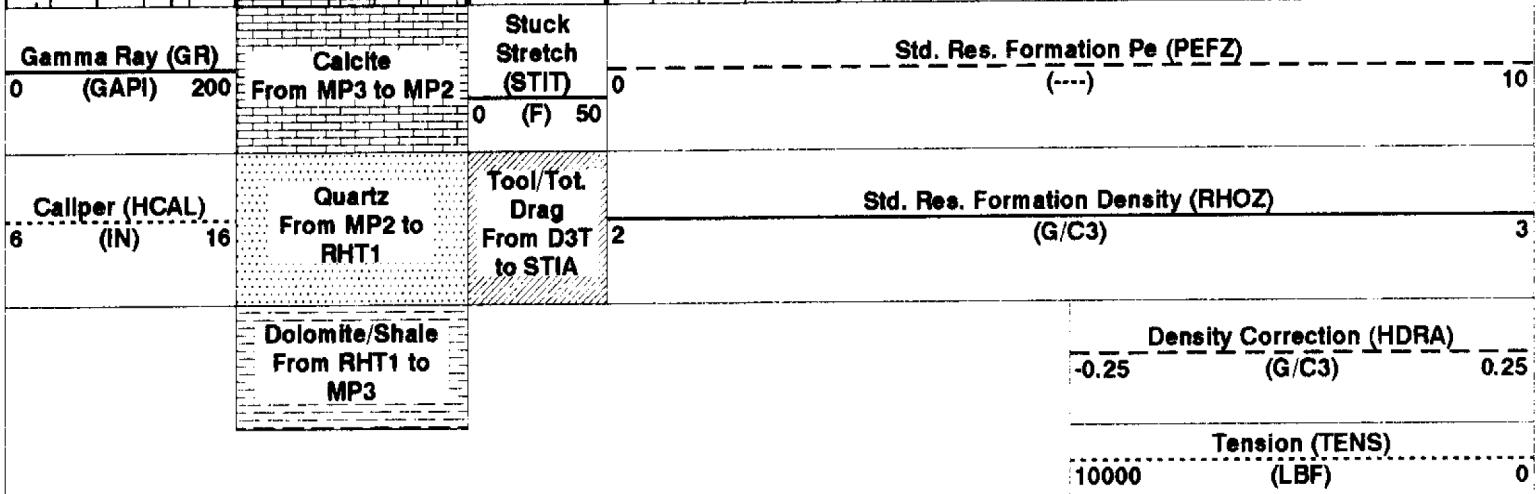
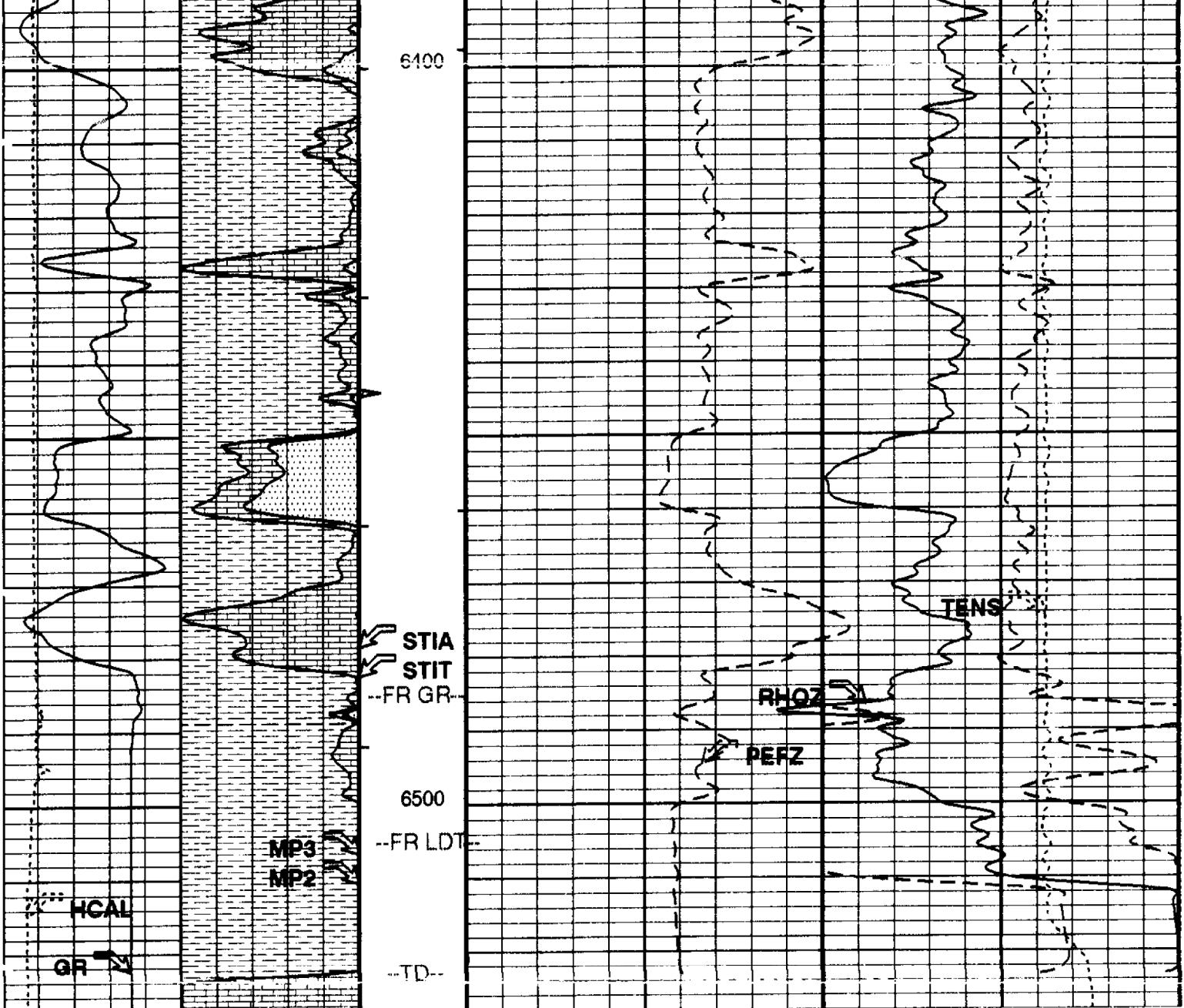
6100



6200

6300





**MAIN PASS**

#### PIP SUMMARY

- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
  - Integrated Cement Volume Minor Pip Every 10 F3
  - Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

#### Parameters

Value

DLIS Name	Description	Value
BDPS	Bulk Density Processing Selector	RHOB
BHT	Bottom Hole Temperature (used in calculations)	136
BS	Bit Size	DEGF 7.875
CLIM	Caliper Limit for Bad Hole	IN 999
CNPS	Corrected Neutron Porosity Selector	NPOR
DFD	Drilling Fluid Density	8.60
DHC	Density Hole Correction	BS
DORL	Depth Offset Repeat Analysis	0.0
DRUL	DRHO Upper Limit	FT 999
FCAL	Caliper Presence Flag	G/C3
FCGR	CGR Presence Flag	PRESENT
FD	Fluid Density	1
FEXP	Form Factor Exponent	2
FLDT	LDT Presence Flag	PRESENT
FNUM	Form Factor Numerator	1
FSON	Sonic Presence Flag	ABSENT
GGRD	Geothermal Gradient	1.000000e-02
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE
HMPCO	HILT RTSC Measure points correction	NO
HSCM	HILT Speed Correction Mode	TSCD_SpeedCorrect
HSTI	STI Uses HILT Acceleration	YES
MATR	Rock Matrix Type	SANDSTONE
NIAV	HRDD Density/Pe Algorithm Version	1
NMT	HILT Nuclear Mud Type	NOBARITE
NPRM	HRDD Processing Mode	StdRes
NSAR	HRDD Depth Sampling Rate	1
PMAX	PHI Maximum	IN 50
POUT	Porosity Output Lithology	PU SANDSTONE
RG21	RHO Grain (2-Mineral Model, Min-1)	2.71
RG22	RHO Grain (2-Mineral Model, Min-2)	2.644
RG23	RHO Grain (2-Mineral Model, Min-3)	2.877
RG31	RHO Grain (3-Mineral Model, Min-1)	2.71
RG32	RHO Grain (3-Mineral Model, Min-2)	2.644
RG33	RHO Grain (3-Mineral Model, Min-3)	2.877
RMFS	Resistivity of Mud Filtrate Sample	2.3700
RTLF	RT Limit Flag	OHMM NO LIMIT
RWF	Resistivity of Free Water	2.000000e-02
SHT	Surface Hole Temperature	OHMM DEGF 49
STKT	STI Stuck Threshold	FT 2.5
TD	Total Depth	6524
TWS	Temperature of Connate Water Sample	FT 100.00
UF	U Fluid	DEGF 0.398
UM21	U Matrix (2-Mineral Model, Min-1)	B/C3 13.77
UM22	U Matrix (2-Mineral Model, Min-2)	B/C3 4.779
UM23	U Matrix (2-Mineral Model, Min-3)	B/C3 8.997
UM31	U Matrix (3-Mineral Model, Min-1)	B/C3 13.77
UM32	U Matrix (3-Mineral Model, Min-2)	B/C3 4.779
UM33	U Matrix (3-Mineral Model, Min-3)	B/C3 8.997

Format: DENS\_MIN    Vertical Scale: 5" per 100'    Graphics File Created: 31-OCT-1996 18:30

### OP System Version: 7C0-427

DBM

HILTB-CTS	RPCVX-680	ALLRES	RPCVX-680
HOLEV	RPCVX-680	PERT	RPCVX-680

### Output DLIS Files

DEFAULT	HILTC .004	FN:3	FIELD	31-OCT-1996 18:30
REDUCED	HILTC .004	FN:4	CUST	31-OCT-1996 18:30

### Input DLIS Files

DEFAULT	HILTC .003	FN:2	FIELD	31-OCT-1996 18:02	6534.0 FT	6098.5 FT
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### Output DLIS Files

DEFAULT	HILTC .004	FN:3	FIELD	31-OCT-1996 18:30
REDUCED	HILTC .004	FN:4	CUST	31-OCT-1996 18:30

### Integrated Hole/Cement Volume Summary

Hole Volume = 141.83 F3

Cement Volume = 70.64 F3 (assuming 5.50 IN casing O.D.)

## OP System Version: 7C0-427

DBM

HILTB-CTS  
HOLEVRPCVX-680  
RPCVX-680ALLRES  
PERTRPCVX-680  
RPCVX-680

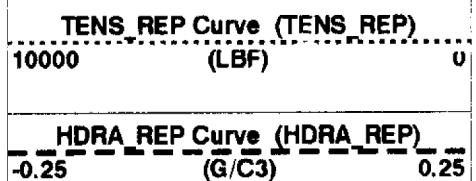
## PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
  - Integrated Cement Volume Minor Pip Every 10 F3
  - Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Dolomite/Shale  
From RHT1 to  
MP3Quartz  
From MP2 to  
RHT1Calcite  
From MP3 to MP2

## REPEAT ANALYSIS

HCAL REP Curve  
(HCAL REP)MP3 REP Curve  
(MP3 REP)

6 (IN)

16 0 (V/V)

GR REP Curve  
(GR REP)MP2 REP Curve  
(MP2 REP)

0 (GAPI)

200 1 (V/V)

RHOZ REP Curve (RHOZ REP)

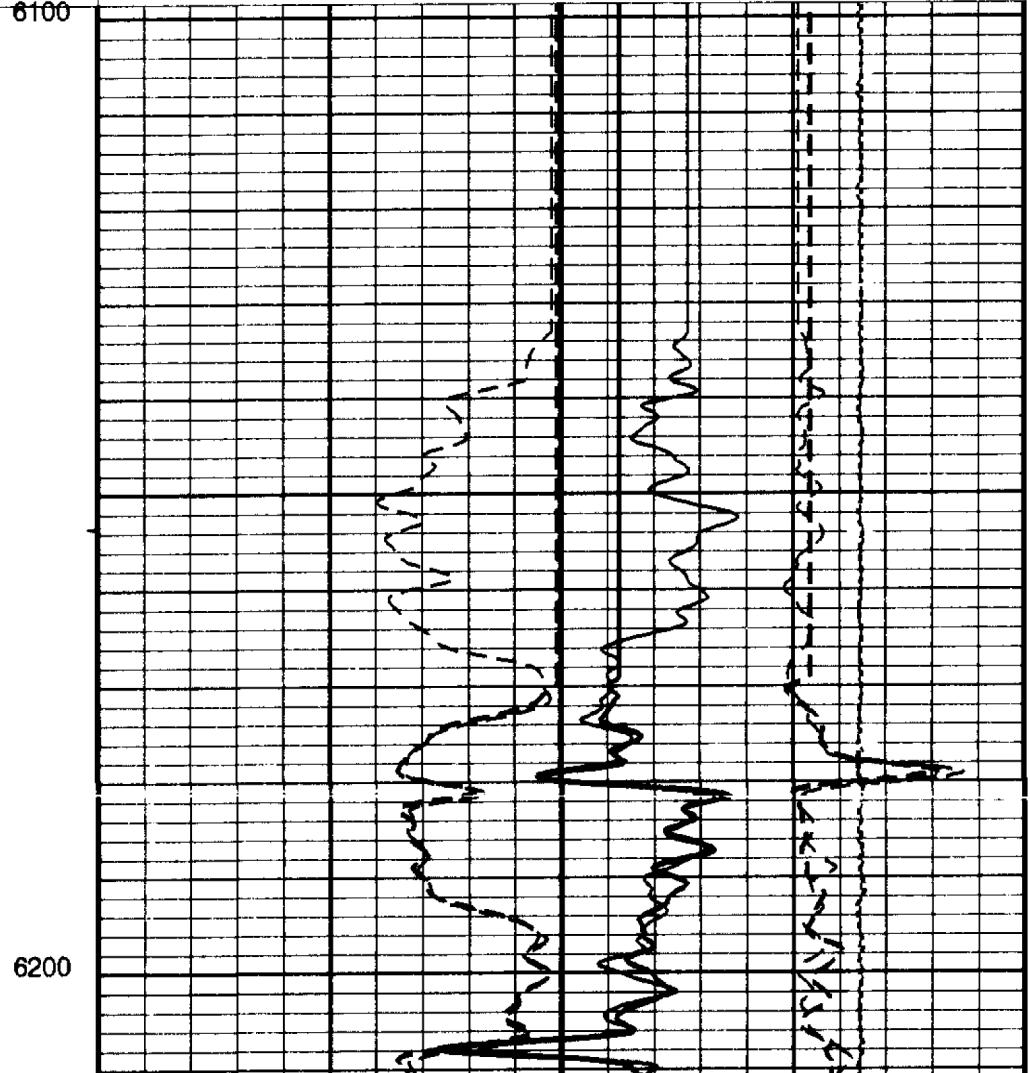
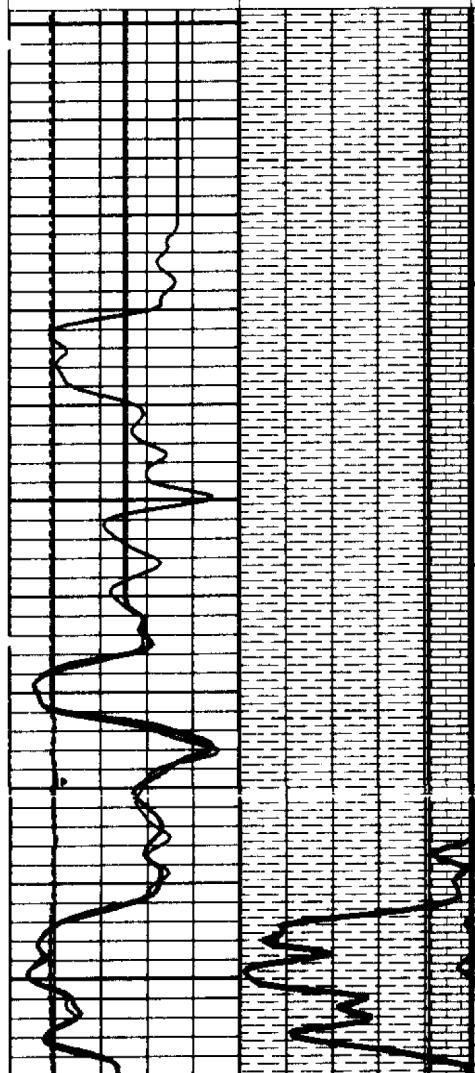
2 (G/C3)

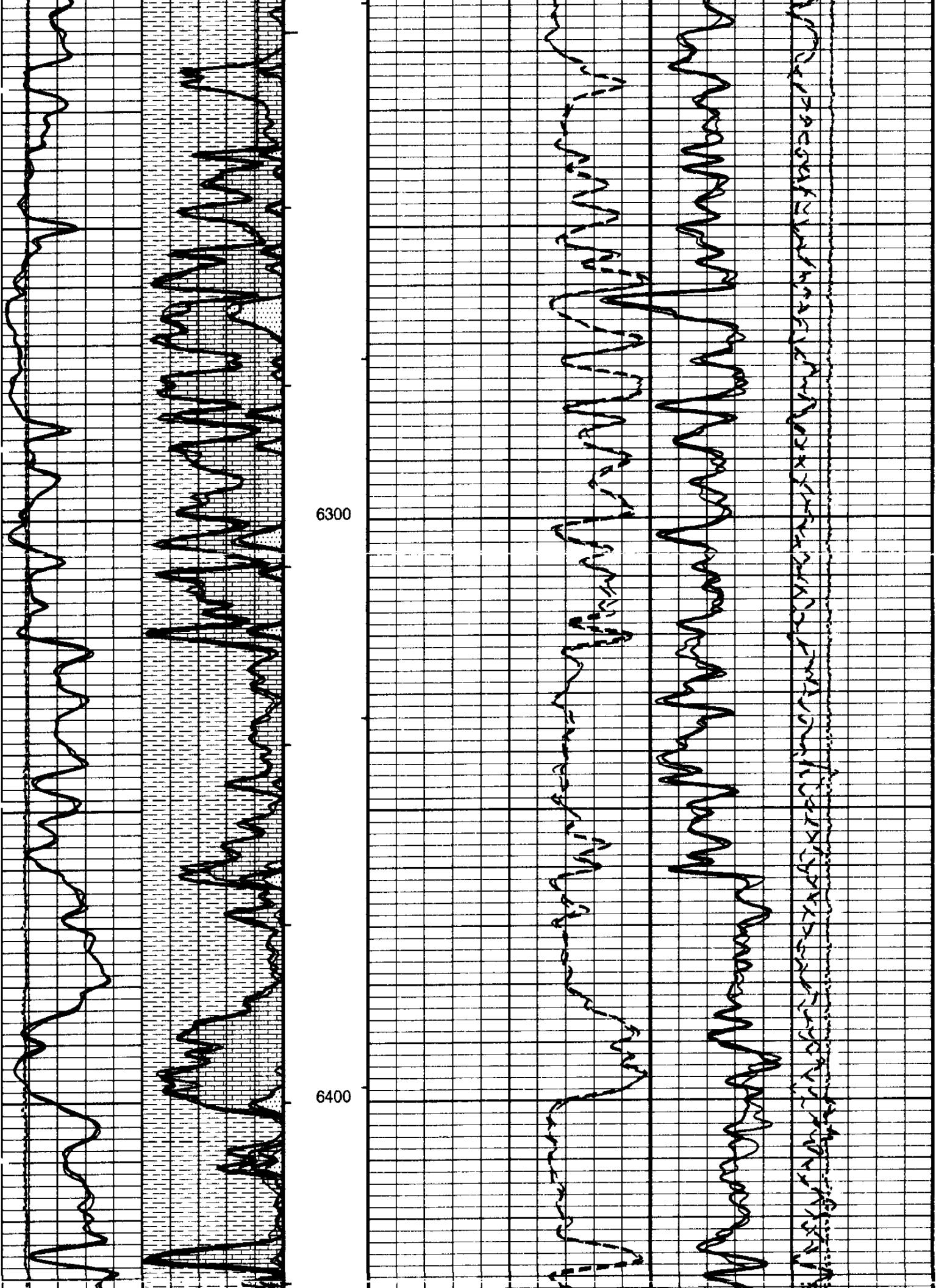
PEFZ REP Curve (PEFZ REP)

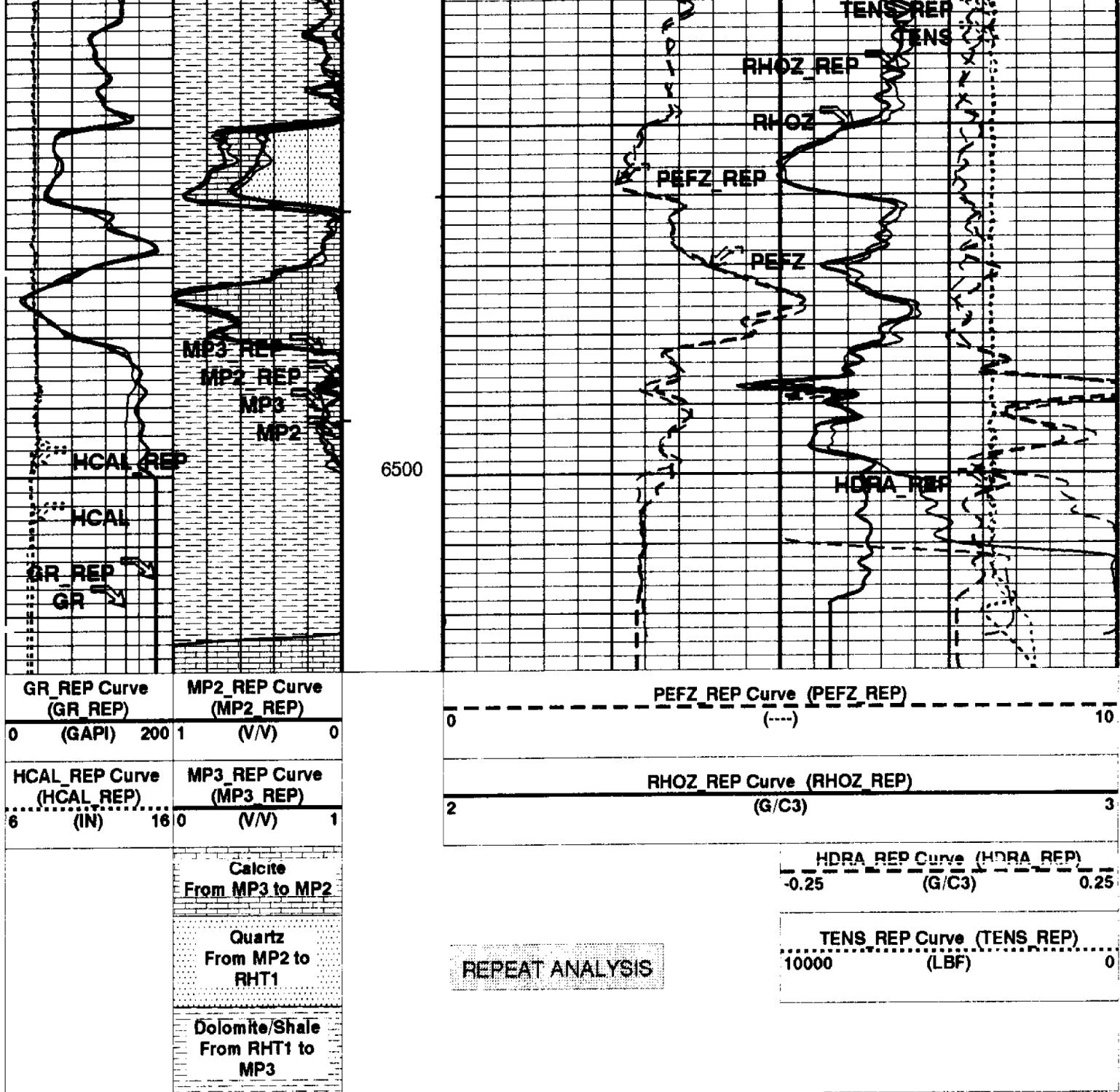
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3

10







#### PIP SUMMARY

- ─ Integrated Hole Volume Minor Pip Every 10 F3
- ─ Integrated Hole Volume Major Pip Every 100 F3
  - ─ Integrated Cement Volume Minor Pip Every 10 F3
  - ─ Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

#### Parameters

DLIS Name	Description	Value
BDPS	Bulk Density Processing Selector	RHOB
BHT	Bottom Hole Temperature (used in calculations)	136 DEGF
BS	Bit Size	7.875 IN
CLIM	Caliper Limit for Bad Hole	999 IN
CNPS	Corrected Neutron Porosity Selector	NPOR
DFD	Drilling Fluid Density	8.60 LB/G
DHC	Density Hole Correction	BS
DORL	Depth Offset Repeat Analysis	0.0 FT
DRUL	DRHO Upper Limit	999 G/C3
FCAL	Caliper Presence Flag	PRESENT
FCGR	CGR Presence Flag	PRESENT

FD	Fluid Density	1	G/C3
FEXP	Form Factor Exponent	2	
FLDT	LDT Presence Flag	PRESENT	
FNUM	Form Factor Numerator	1	
FSON	Sonic Presence Flag	ABSENT	
GGRD	Geothermal Gradient	1.000000e-02	DF/F
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HMPCO	HILT RTSC Measure points correction	NO	
HSCM	HILT Speed Correction Mode	TSCD_SpeedCorrect	
HSTI	STI Uses HILT Acceleration	YES	
MATR	Rock Matrix Type	SANDSTONE	
NIAV	HRDD Density/Pe Algorithm Version	1	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PMAX	PHI Maximum	50	PU
POUT	Porosity Output Lithology	SANDSTONE	
RG21	RHO Grain (2-Mineral Model, Min-1)	2.71	G/C3
RG22	RHO Grain (2-Mineral Model, Min-2)	2.644	G/C3
RG23	RHO Grain (2-Mineral Model, Min-3)	2.877	G/C3
RG31	RHO Grain (3-Mineral Model, Min-1)	2.71	G/C3
RG32	RHO Grain (3-Mineral Model, Min-2)	2.644	G/C3
RG33	RHO Grain (3-Mineral Model, Min-3)	2.877	G/C3
RMFS	Resistivity of Mud Filtrate Sample	2.3700	OHMM
RTLF	RT Limit Flag	NO LIMIT	
RWF	Resistivity of Free Water	2.000000e-02	OHMM
SHT	Surface Hole Temperature	49	DEGF
TD	Total Depth	6524	FT
TWS	Temperature of Connate Water Sample	100.00	DEGF
UF	U Fluid	0.398	B/C3
UM21	U Matrix (2-Mineral Model, Min-1)	13.77	B/C3
UM22	U Matrix (2-Mineral Model, Min-2)	4.779	B/C3
UM23	U Matrix (2-Mineral Model, Min-3)	8.997	B/C3
UM31	U Matrix (3-Mineral Model, Min-1)	13.77	B/C3
UM32	U Matrix (3-Mineral Model, Min-2)	4.779	B/C3
UM33	U Matrix (3-Mineral Model, Min-3)	8.997	B/C3

Format: DENS\_MIN\_REP Vertical Scale: 5" per 100'

Graphics File Created: 31-OCT-1996 18:30

**OP System Version: 7C0-427**

DBM

HILTB-CTS	RPCVX-680	ALLRES	RPCVX-680
HOLEV	RPCVX-680	PERT	RPCVX-680

**Input DLIS Files**

DEFAULT HILTC .003 FN:2 FIELD 31-OCT-1996 18:02 6534.0 FT 6098.5 FT

**Output DLIS Files**DEFAULT HILTC .004 FN:3 FIELD 31-OCT-1996 18:30  
REDUCED HILTC .004 FN:4 CUST 31-OCT-1996 18:30**Calibration and Check Summary**

Measurement	Nominal	Master	Before	After	Change	Limit	Units
High resolution Integrated Logging Tool-CTS Wellsite Calibration - Electronics Calibration Check - Thru Cal Mag. & Phase							
Master: Calibration out of date Jun 15 08:08 1996 Before: Oct 31 03:47 1996							
Thru Cal Magnitude - 0	0	0.6235	0.6241	N/A	N/A	N/A	V
Thru Cal Magnitude - 1	0	1.278	1.279	N/A	N/A	N/A	V
Thru Cal Magnitude - 2	0	0.6344	0.6345	N/A	N/A	N/A	V
Thru Cal Magnitude - 3	0	0.7182	0.7191	N/A	N/A	N/A	V
Thru Cal Magnitude - 4	0	1.342	1.345	N/A	N/A	N/A	V
Thru Cal Magnitude - 5	0	1.954	1.956	N/A	N/A	N/A	V
Thru Cal Magnitude - 6	0	1.953	1.954	N/A	N/A	N/A	V
Thru Cal Magnitude - 7	0	1.393	1.398	N/A	N/A	N/A	V
Phase - 0	0	55.81	57.18	N/A	N/A	N/A	DEG
Phase - 1	0	54.71	56.09	N/A	N/A	N/A	DEG
Phase - 2	0	50.99	52.41	N/A	N/A	N/A	DEG
Phase - 3	0	50.20	51.62	N/A	N/A	N/A	DEG
Phase - 4	0	43.97	45.44	N/A	N/A	N/A	DEG
Phase - 5	0	42.09	43.61	N/A	N/A	N/A	DEG
Phase - 6	0	42.09	43.61	N/A	N/A	N/A	DEG
Phase - 7	0	22.45	20.24	N/A	N/A	N/A	DEG

Phase - 7	0	38.43	40.94	N/A	N/A	N/A	DEG
<b>High resolution Integrated Logging Tool-CTS Wellsite Calibration - Electronics Calibration Check - Auxillary</b>							
Master: Calibration out of date Jun 15 08:08 1996	Before: Oct 31 03:47 1996						
AIT-H SPA Plus	990.5	993.0	993.7	N/A	N/A	N/A	MV
AIT-H SPA Zero	0	-0.2287	-0.2130	N/A	N/A	N/A	MV
AIT-H Temperature Plus	0.9150	0.9198	0.9205	N/A	N/A	N/A	V
AIT-H Temperature Zero	0	-0.0002239	-0.0002027	N/A	N/A	N/A	V

#### High resolution Integrated Logging Tool-CTS Wellsite Calibration - Test Loop Gain Correction

Master: Calibration out of date Jun 15 08:08 1996							
Test Loop Gain Magnitude - 0	0	1.016	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 1	0	1.014	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 2	0	1.017	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 3	0	1.015	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 4	0	0.9943	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 5	0	1.007	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 6	0	1.014	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 7	0	1.026	N/A	N/A	N/A	N/A	V
Phase - 0	0	0.4351	N/A	N/A	N/A	N/A	DEG
Phase - 1	0	0.4877	N/A	N/A	N/A	N/A	DEG
Phase - 2	0	-0.07914	N/A	N/A	N/A	N/A	DEG
Phase - 3	0	-0.01529	N/A	N/A	N/A	N/A	DEG
Phase - 4	0	-0.08327	N/A	N/A	N/A	N/A	DEG
Phase - 5	0	-0.3508	N/A	N/A	N/A	N/A	DEG
Phase - 6	0	0.01955	N/A	N/A	N/A	N/A	DEG
Phase - 7	0	-0.3622	N/A	N/A	N/A	N/A	DEG

#### High resolution Integrated Logging Tool-CTS Wellsite Calibration - Sonde Error Correction

Master: Calibration out of date Jun 15 08:08 1996							
R Sonde Error Correction - 0	0	-117.3	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 1	0	162.8	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 2	0	107.8	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 3	0	60.03	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 4	0	24.85	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 5	0	13.28	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 6	0	9.377	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 7	0	-0.4773	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 0	0	-242.4	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 1	0	281.1	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 2	0	103.4	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 3	0	-8.335	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 4	0	-7.819	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 5	0	3.205	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 6	0	5.059	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 7	0	10.05	N/A	N/A	N/A	N/A	MM/M

#### High resolution Integrated Logging Tool-CTS Wellsite Calibration - Mud Gain Correction

Master: Calibration out of date Jun 15 08:08 1996							
Coarse - Mag, Real, Imag - 0	0	1.100	N/A	N/A	N/A	N/A	N/A
Coarse - Mag, Real, Imag - 1	0	1.100	N/A	N/A	N/A	N/A	N/A
Coarse - Mag, Real, Imag - 2	0	1.100	N/A	N/A	N/A	N/A	N/A
Fine - Mag, Real, Imag - 0	0	1.098	N/A	N/A	N/A	N/A	N/A
Fine - Mag, Real, Imag - 1	0	1.099	N/A	N/A	N/A	N/A	N/A
Fine - Mag, Real, Imag - 2	0	1.099	N/A	N/A	N/A	N/A	N/A

#### High resolution Integrated Logging Tool-CTS Wellsite Calibration - Stab Measurement Summary

Before: Oct 29 18:21 1996							
BS Window Ratio	0.9774	N/A	0.9862	N/A	N/A	N/A	N/A
BS Window Sum	16100	N/A	16100	N/A	N/A	N/A	CPS
SS Window Ratio	0.4734	N/A	0.4747	N/A	N/A	N/A	N/A
SS Window Sum	11670	N/A	11650	N/A	N/A	N/A	CPS
LS Window Ratio	0.2997	N/A	0.2980	N/A	N/A	N/A	N/A
LS Window Sum	1610	N/A	1599	N/A	N/A	N/A	CPS

#### High resolution Integrated Logging Tool-CTS Wellsite Calibration - Photo-multiplier High Voltages Calibrations

Before: Oct 29 18:21 1996							
BS PM High Voltage (Command)	1535	N/A	1503	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1646	N/A	1649	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1879	N/A	1879	N/A	N/A	N/A	V

#### High resolution Integrated Logging Tool-CTS Wellsite Calibration - Crystal Quality Resolutions Calibration

Before: Oct 29 18:21 1996							
BS Crystal Resolution	12.73	N/A	12.54	N/A	N/A	N/A	%
SS Crystal Resolution	9.561	N/A	9.566	N/A	N/A	N/A	%
LS Crystal Resolution	9.822	N/A	10.09	N/A	N/A	N/A	%

#### High resolution Integrated Logging Tool-CTS Wellsite Calibration - MCFL Calibration

Before: Oct 29 18:22 1996							
Raw B0 Resistivity	3875	N/A	3870	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3855	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3863	N/A	N/A	N/A	OHMM

High resolution Integrated Logging Tool-CTS Wellsite Calibration - HILT Caliper Calibration

Before: Oct 29 18:18 1996

HILT Caliper Zero Measurement	8.000	N/A	7.866	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	12.11	N/A	N/A	N/A	IN

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Detector Calibration

Before: Oct 29 18:29 1996

Gamma Ray Background	30.00	N/A	37.37	N/A	N/A	N/A	GAPI
Gamma Ray (Jig - Bkg)	178.6	N/A	178.6	N/A	N/A	16.24	GAPI
Gamma Ray (Calibrated)	165.0	N/A	165.0	N/A	N/A	15.00	GAPI

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Zero Measurement

Master: Aug 2 02:04 1996 Before: Oct 29 18:20 1996

CNTC Background	25.80	25.80	26.17	N/A	N/A	3.870	CPS
CFTC Background	26.10	26.10	24.00	N/A	N/A	3.915	CPS

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Accelerometer Calibration

Before: Oct 30 02:08 1996

Z-Axis Acceleration	32.19	N/A	32.12	N/A	N/A	N/A	F/S2
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The CNT Master Calibration Was Done With The Following Parameters :

NCT-B Water Temperature 83.0 DEGF.  
Thermal Housing Size 3.375 IN.

High resolution Integrated Logging Tool-CTS / Equipment Identification

Primary Equipment:

Array Induction Tool - H	AIT - H
Array Induction Sonde	AHIS - BA
HILT high-Resolution Mechanical Sonde	HRMS - B
HILT Rxo Gamma-ray Device	HRGD -
HILT Nuclear Back-Scatter Detector	HILT -
HILT Nuclear Short-Spacing Detector	HILT -
HILT Nuclear Long-Spacing Detector	HILT -
Micro Cylindrically Focused Log Device	MCFL -

Auxiliary Equipment:

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Electronics Calibration Check - Thru Cal Mag. & Phase

Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6235		0.6050	55.81		71.00
	Before	0.6241			57.18		
1	Master	1.278		1.270	54.71		70.00
	Before	1.279			56.09		
2	Master	0.6344		0.6230	50.99		66.00
	Before	0.6345			52.41		
3	Master	0.7182		0.7040	50.20		65.00
	Before	0.7191			51.62		
4	Master	1.342		1.337	43.97		59.00
	Before	1.345			45.44		
5	Master	1.954		1.955	42.09		57.00
	Before	1.956			43.61		
6	Master	1.953		1.955	42.09		57.00
	Before	1.954			43.61		
7	Master	1.393		1.415	38.45		53.00
	Before	1.398			40.34		

60.00 % (Minimum) 140.0 % (Maximum) Nom -60.00 (Minimum) (Nominal) Nom + 60.00 (Maximum)

High resolution Integrated Logging Tool-CTS Wellsite Calibration					
Electronics Calibration Check - Auxiliary					
Phase	AIT-H SPA Plus MV	Value	Phase	AIT-H SPA Zero MV	Value
Master	<input type="button" value="■"/>	993.0	Master	<input type="button" value="■"/>	-0.2287
Before	<input type="button" value="■"/>	993.7	Before	<input type="button" value="■"/>	-0.2130
941.0 (Minimum)	990.5 (Nominal)	1040 (Maximum)	-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
Phase	AIT-H Temperature Plus V	Value	Phase	AIT-H Temperature Zero V	Value
Master	<input type="button" value="■"/>	0.9198	Master	<input type="button" value="■"/>	-0.0002239
Before	<input type="button" value="■"/>	0.9205	Before	<input type="button" value="■"/>	-0.0002027
0.8700 (Minimum)	0.9150 (Nominal)	0.9600 (Maximum)	-0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)

Master: Calibration out of date Jun 15 08:08 1996

Before: Oct 31 03:47 1996

High resolution Integrated Logging Tool-CTS Wellsite Calibration					
Test Loop Gain Correction					
Idx	Value	Test Loop Gain Magnitude V	Value	Phase DEG	
0	1.016	<input type="button" value="■"/>	0.4351	<input type="button" value="■"/>	0.4351
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)
1	1.014	<input type="button" value="■"/>	0.4877	<input type="button" value="■"/>	0.4877
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)
2	1.017	<input type="button" value="■"/>	-0.07914	<input type="button" value="■"/>	-0.07914
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)
3	1.015	<input type="button" value="■"/>	-0.01529	<input type="button" value="■"/>	-0.01529
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)
4	0.9943	<input type="button" value="■"/>	-0.08327	<input type="button" value="■"/>	-0.08327
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)
5	1.007	<input type="button" value="■"/>	-0.3508	<input type="button" value="■"/>	-0.3508
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)
6	1.014	<input type="button" value="■"/>	0.01955	<input type="button" value="■"/>	0.01955
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)
7	1.026	<input type="button" value="■"/>	-0.3622	<input type="button" value="■"/>	-0.3622
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)

Master: Calibration out of date Jun 15 08:08 1996

High resolution Integrated Logging Tool-CTS Wellsite Calibration					
Sonde Error Correction					
Idx	Value	R Sonde Error Correction MM/M	Value	X Sonde Error Correction MM/M	
0	-117.3	<input type="button" value="■"/>	-242.4	<input type="button" value="■"/>	-242.4
	-231.0 (Minimum)	-56.00 (Nominal)	119.0 (Maximum)	-2250 (Minimum)	0 (Nominal)
	114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)	-625.0 (Minimum)	0 (Nominal)
1	162.8	<input type="button" value="■"/>	281.1	<input type="button" value="■"/>	281.1
	66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)	-350.0 (Minimum)	0 (Nominal)
	39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)	-250.0 (Minimum)	0 (Nominal)
2	107.8	<input type="button" value="■"/>	103.4	<input type="button" value="■"/>	103.4
	66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)	-350.0 (Minimum)	0 (Nominal)
	39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)	-250.0 (Minimum)	0 (Nominal)
3	60.03	<input type="button" value="■"/>	-8.335	<input type="button" value="■"/>	-8.335
	15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)	-63.00 (Minimum)	0 (Nominal)
	13.28	<input type="button" value="■"/>	3.205	<input type="button" value="■"/>	3.205
4	24.85	<input type="button" value="■"/>	-7.819	<input type="button" value="■"/>	-7.819
	15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)	-63.00 (Minimum)	0 (Nominal)
5					

	4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)	-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
6	9.377			5.059		
	5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)	-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
7	-0.4773			10.05		
	-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)	-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)

Master: Calibration out of date Jun 15 08:08 1996

High resolution Integrated Logging Tool-CTS Wellsite Calibration						
Mud Gain Correction						
Idx	Value	Coarse - Mag, Real, Imag		Value	Fine - Mag, Real, Imag	
0	1.100			1.098		
	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)
1	1.100			1.099		
	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)
2	1.100			1.099		
	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)

Master: Calibration out of date Jun 15 08:08 1996

High resolution Integrated Logging Tool-CTS Wellsite Calibration								
Stab Measurement Summary								
Phase	BS Window Ratio	Value	Phase	SS Window Ratio	Value	Phase	LS Window Ratio	Value
Before		0.9862	Before		0.4747	Before		0.2980
0.9285 (Minimum)	0.9774 (Nominal)	1.026 (Maximum)	0.4497 (Minimum)	0.4734 (Nominal)	0.4971 (Maximum)	0.2848 (Minimum)	0.2997 (Nominal)	0.3147 (Maximum)
Phase	BS Window Sum CPS	Value	Phase	SS Window Sum CPS	Value	Phase	LS Window Sum CPS	Value
Before		16100	Before		11650	Before		1599
15290 (Minimum)	16100 (Nominal)	16900 (Maximum)	11090 (Minimum)	11670 (Nominal)	12260 (Maximum)	1529 (Minimum)	1610 (Nominal)	1690 (Maximum)

Before: Oct 29 18:21 1996

High resolution Integrated Logging Tool-CTS Wellsite Calibration								
Photo-multiplier High Voltages Calibrations								
Phase	BS PM High Voltage (Command) V	Value	Phase	SS PM High Voltage (Command) V	Value	Phase	LS PM High Voltage (Command) V	Value
Before		1503	Before		1649	Before		1879
1435 (Minimum)	1535 (Nominal)	1635 (Maximum)	1546 (Minimum)	1646 (Nominal)	1746 (Maximum)	1779 (Minimum)	1879 (Nominal)	1979 (Maximum)

Before: Oct 29 18:21 1996

High resolution Integrated Logging Tool-CTS Wellsite Calibration								
Crystal Quality Resolutions Calibration								
Phase	BS Crystal Resolution %	Value	Phase	SS Crystal Resolution %	Value	Phase	LS Crystal Resolution %	Value
Before		12.54	Before		9.566	Before		10.09
11.73 (Minimum)	12.73 (Nominal)	13.73 (Maximum)	8.561 (Minimum)	9.561 (Nominal)	10.56 (Maximum)	8.822 (Minimum)	9.822 (Nominal)	10.82 (Maximum)

Before: Oct 29 18:21 1996

High resolution Integrated Logging Tool-CTS Wellsite Calibration								
MCFL Calibration								
Phase	Raw B0 Resistivity OHMM	Value	Phase	Raw B1 Resistivity OHMM	Value	Phase	Raw B2 Resistivity OHMM	Value
Before		3870	Before		3855	Before		3863
3565 (Minimum)	3875 (Nominal)	4185 (Maximum)	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)

Before: Oct 29 18:22 1996

High resolution Integrated Logging Tool-CTS Wellsite Calibration						
HILT Caliper Calibration						
Phase	HILT Caliper Zero Measurement IN	Value	Phase	HILT Caliper Plus Measurement IN	Value	
Before		7.866	Before		12.11	
6.000 (Minimum)	8.000 (Nominal)	10.00 (Maximum)	9.000 (Minimum)	12.00 (Nominal)	15.00 (Maximum)	

Before: Oct 29 18:18 1996

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI	Value	Phase	Gamma Ray (Jig - Bkg) GAPI	Value	Phase	Gamma Ray (Calibrated) GAPI	Value
Before		37.37	Before		178.6	Before		165.0
0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)	162.4 (Minimum)	178.6 (Nominal)	194.9 (Maximum)	150.0 (Minimum)	165.0 (Nominal)	180.0 (Maximum)

Before: Oct 29 18:29 1996

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		25.00	Master		26.10
Before		26.17	Before		24.00
5.000 (Minimum)	25.80 (Nominal)	30.000 (Maximum)	5.000 (Minimum)	26.10 (Nominal)	40.00 (Maximum)

Master: Aug 20 02:04 1996

Before: Oct 29 18:20 1996

High resolution Integrated Logging Tool-CTS  
Wellsite Calibration

Accelerometer Calibration

Phase	Z-Axis Acceleration F/S2	Value
Before		32.12
31.53 (Minimum)	32.19 (Nominal)	32.84 (Maximum)

Before: Oct 30 02:08 1996

COMPANY	PETROGLYPH OPERATING COMPANY INC.	BOTTOM LOG INTERVAL	6504 F
WELL	UTE TRIBAL #03-04	SCHLUMBERGER DEPTH	6522 F
FIELD	ANTELOPE CREEK	DEPTH DRILLER	6524 F
COUNTY	DUCHESENE	KELLY BUSHING	5901.9 F
STATE	UTAH	DRILL FLOOR	5900.9 F
		GROUND LEVEL	5891.9 F

Schlumberger

COMPENSATED NEUTRON  
LITHO-DENSITY  
GAMMA RAY

COMPANY: PETROGLYPH OPERATING  
 COMPANY, INC.  
 UTE TRIBAL #03-04

FIELD: ANTELOPE CREEK

COUNTY: DUCHESNE STATE: UTAH

**Schlumberger** **ARRAY INDUCTION**  
**with Linear Correlation**  
**GAMMA RAY**

360' FNL & 460' FWL	Elev.: K.B. 5891.9 F
LOT 4	G.L. 5891.9 F
12 NOZ.	D.F. 5890.9 F
DRILL	
Permanent Datum:	GROUND LEVEL
Log Measured From:	KELLY BUSHING
Drilling-Measured From:	KELLY BUSHING

API Serial No.	SECTION	TOWNSHIP	RANGE
43-013-31736	3	5 S	3 W

Logging Date	Run Number	Run Number	Run Number
31-OCT-1996	ONE	ONE	ONE
Depth Driller	6524 F	6524 F	6524 F
Schlumberger Depth	6522 F	6522 F	6522 F
Bottom Log Interval	6514 F	6514 F	6514 F
Top Log Interval	40 F	40 F	40 F
Casing Driller Size @ Depth	8.625 IN	@	427 F
Casing Schlumberger	428 F		
Bit Size	7.875 IN		
Type Fluid In Hole	AMMONIUM CHLORIDE		
Density	28 S		
Fluid Loss	PH	10.2	
Source Of Sample	FLOW LINE		

**CONFIDENTIAL**

**DEC 11 1996**

RMF @ Measured Temperature	2.370 OHMM	@	49 DEG	RMF @ Measured Temperature	2.370 OHMM	@	49 DEG
RMC @ Measured Temperature	2.370 OHMM	@	49 DEG	RMC @ Measured Temperature	2.370 OHMM	@	49 DEG
Source RMF	RMC	CALCULATED		Source RMF	RMC		
RM @ MRT	RMF @ MRT	0.907 @ 139	@ 139	RM @ MRT	RMF @ MRT	@	@
Maximum Recorded Temperatures	139 DEGF			Maximum Recorded Temperatures	139 DEGF		
Circulation Stopped	Time	31-OCT-1996	11:30	Circulation Stopped	Time		
Logger On Bottom	Time	31-OCT-1996	18:30	Logger On Bottom	Time		
Unit Number	Location	2018	VERNAL, UTAH	Unit Number	Location		
Recorded By		A. WHITE		Recorded By			
Witnessed By		MR. KENT STRINGHAM		Witnessed By			

ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS AND WE CANNOT, AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATIONS, AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFUL NEGLIGENCE ON OUR PART, BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COSTS, DAMAGES OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO CLAUSE 4 OF OUR GENERAL TERMS AND CONDITIONS AS SET OUT IN OUR CURRENT PRICE SCHEDULE.

OTHER SERVICES1 OS1: TLDT/CNT/GR OS2: OS3: OS4: OS5:	OTHER SERVICES2 OS1: OS2: OS3: OS4: OS5:				
REMARKS: RUN NUMBER 1 1.125 " STANDOFFS USED ON AITH GAS KICKS DROPPED FLUID LEVEL TO 2356	REMARKS: RUN NUMBER 2				
THANKS FOR USING SCHLUMBERGER!!					
SWS CREW: J RIXEY / G BATTY					
RUN 1 SERVICE ORDER #: 670214 PROGRAM VERSION: 7C0-427 FLUID LEVEL: 2356 F	RUN 2 SERVICE ORDER #: PROGRAM VERSION: FLUID LEVEL:				
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

## EQUIPMENT DESCRIPTION

### RUN 1

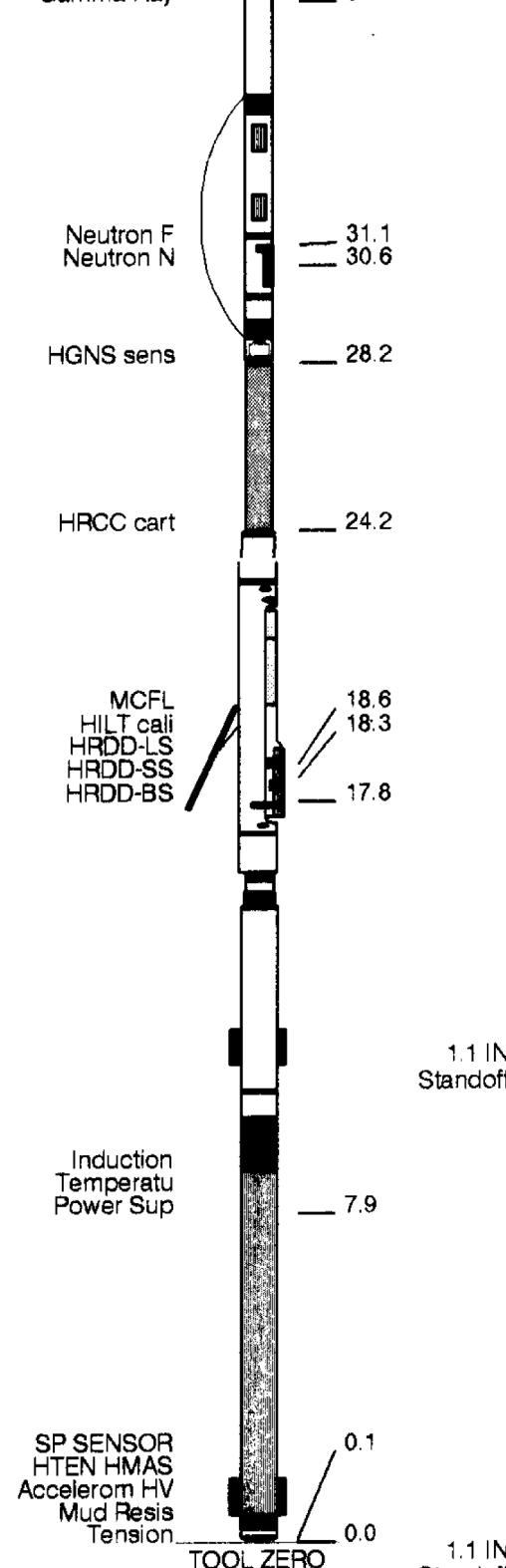
SURFACE EQUIPMENT  
TCM-AB 88 NCS-VB  
GSR-U/Y  
NCT-B  
CNB-AB

### RUN 2

#### DOWNTIME EQUIPMENT

PEH-A		40.8
PEH-A		
AH-64	HGNS HTEM	39.0
AH-64	HMCA	
	TelStatus	
	CTEM	
HILT-B-CTS	Gamma-Ray	37.6
		36.9

HGNSC-B  
 HMCA  
 TCC-B  
 HGNS-H  
 NLS-KL  
 NSR-F 2549  
 HACZ  
 HCNT  
 HGR  
 HRCC-B 828  
 HRMS-B 830  
 HRGD 818  
 GLS-VJ 1867  
 MCFL Device  
 HILT Nucl. LS  
 HILT Nucl. SS  
 HILT Nucl. BS  
 AIT-H  
 AHIS-BA 100  
 BOW-SPR  
 NPV-N



### Output DLIS Files

DEFAULT	HILTC .004	FN:3	FIELD	31-OCT-1996 18:30	6528.0 FT	-7.5 FT
REDUCED	HILTC .004	FN:4	CUST	31-OCT-1996 18:30		

### Integrated Hole/Cement Volume Summary

Hole Volume = 2179.93 F3

Cement Volume = 1173.97 F3 (assuming 5.50 IN casing O.D.)

Computed from 6524.0 FT to 427.0 FT using data channel(s) HCAL

HILTB-CTS  
HOLEVRPCVX-680  
RPCVX-680ALLRES  
PERTRPCVX-680  
RPCVX-680

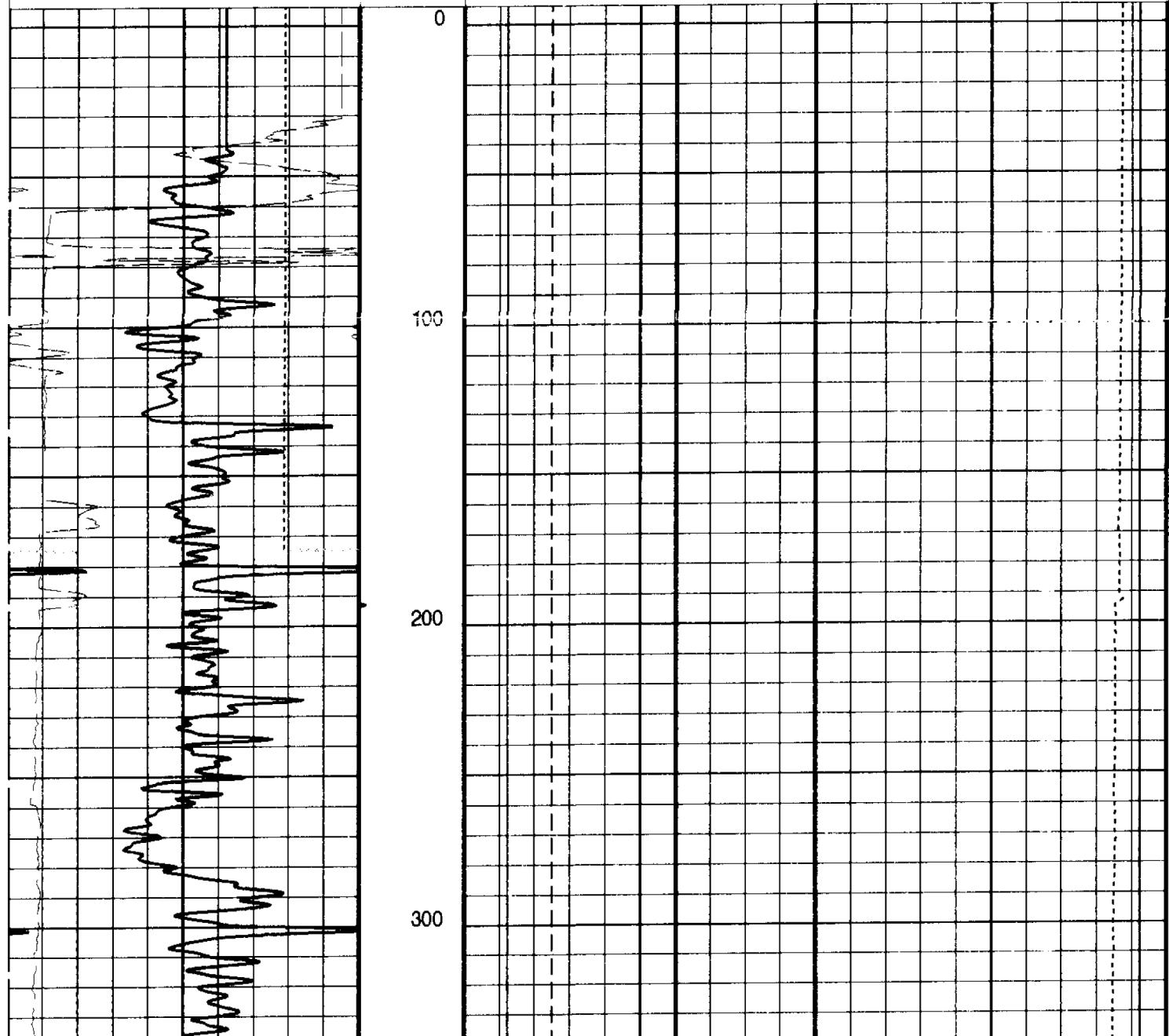
## PIP SUMMARY

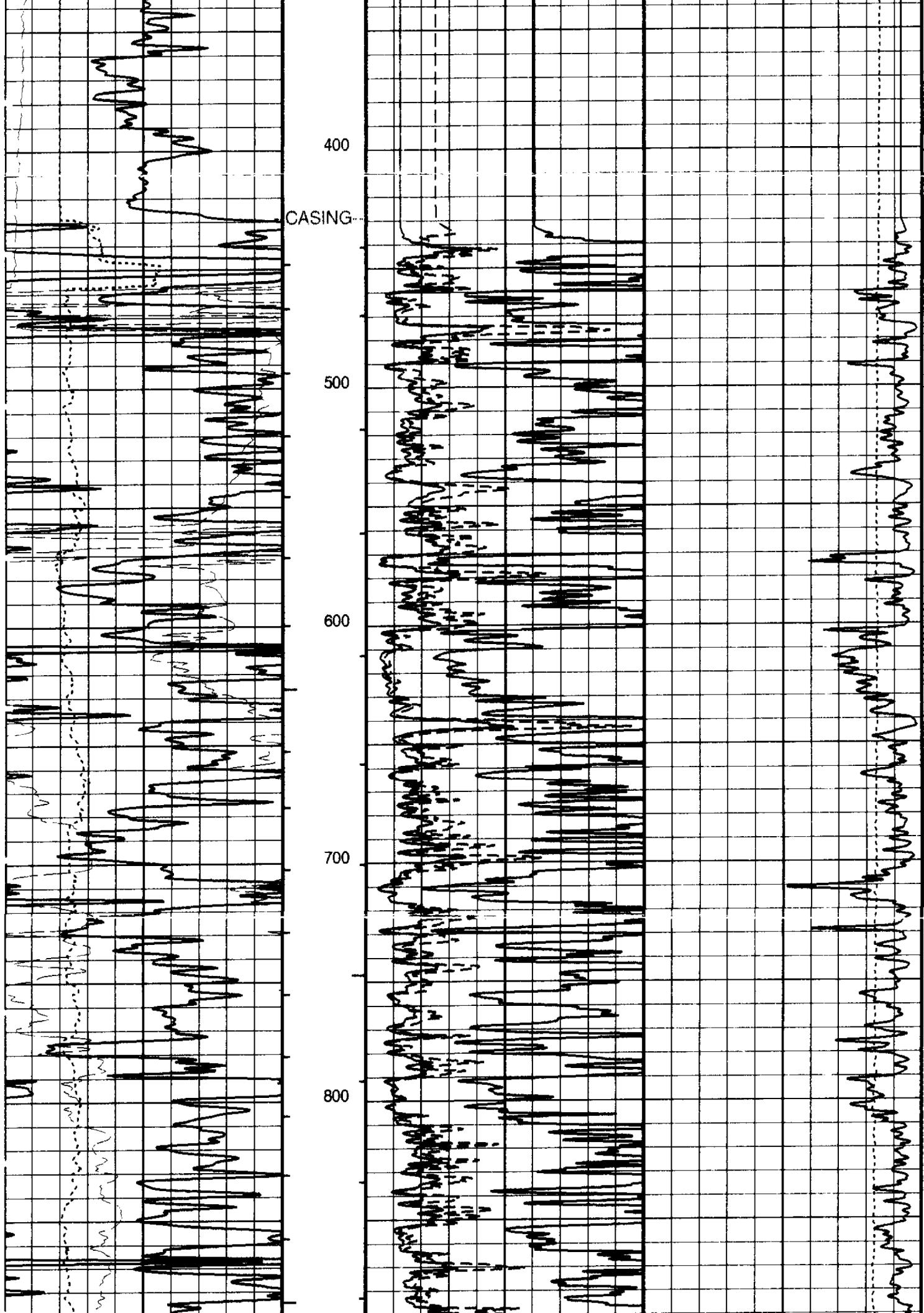
## MAIN PASS

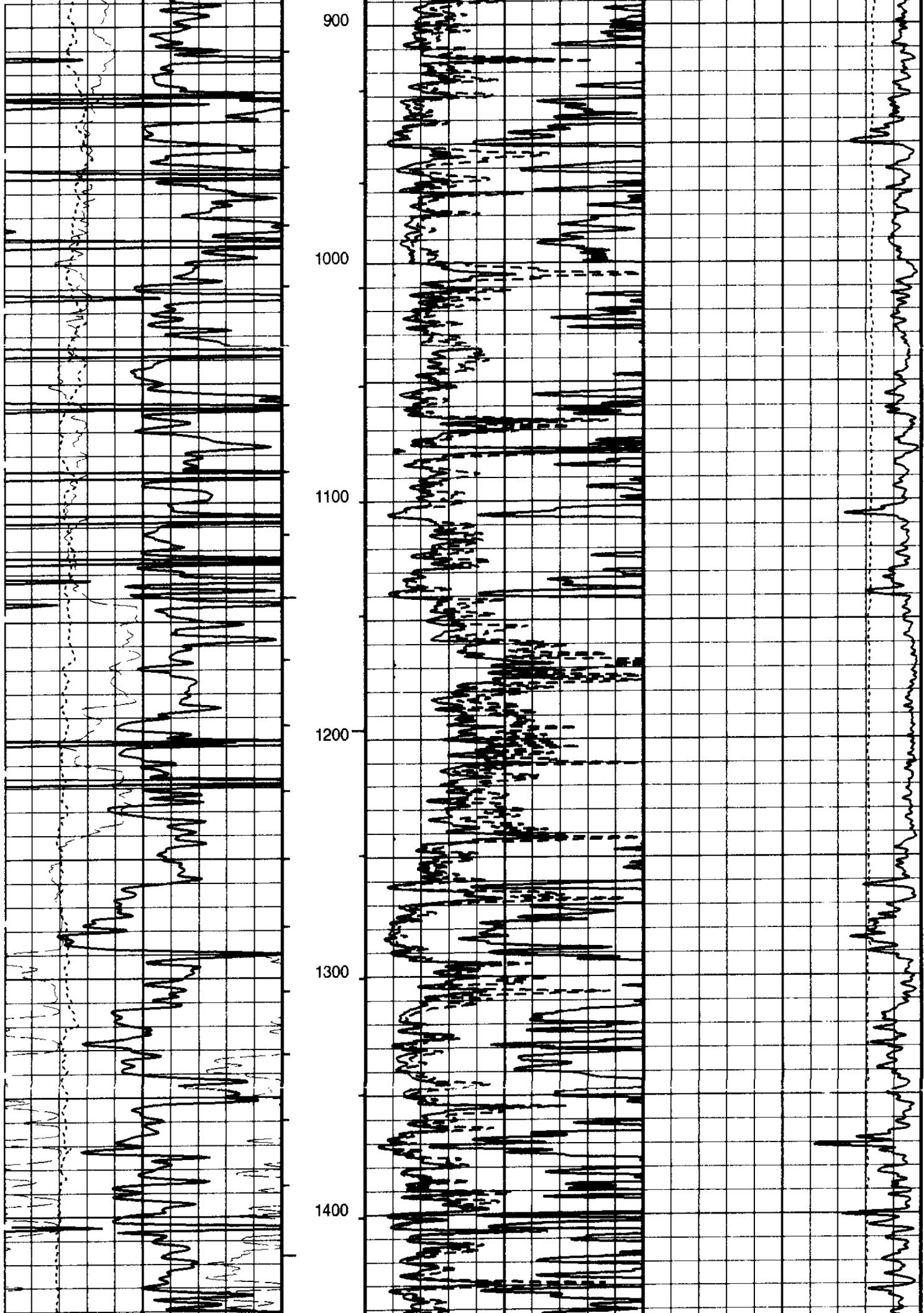
- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
  - Integrated Cement Volume Minor Pip Every 10 F3
  - Integrated Cement Volume Major Pip Every 100 F3

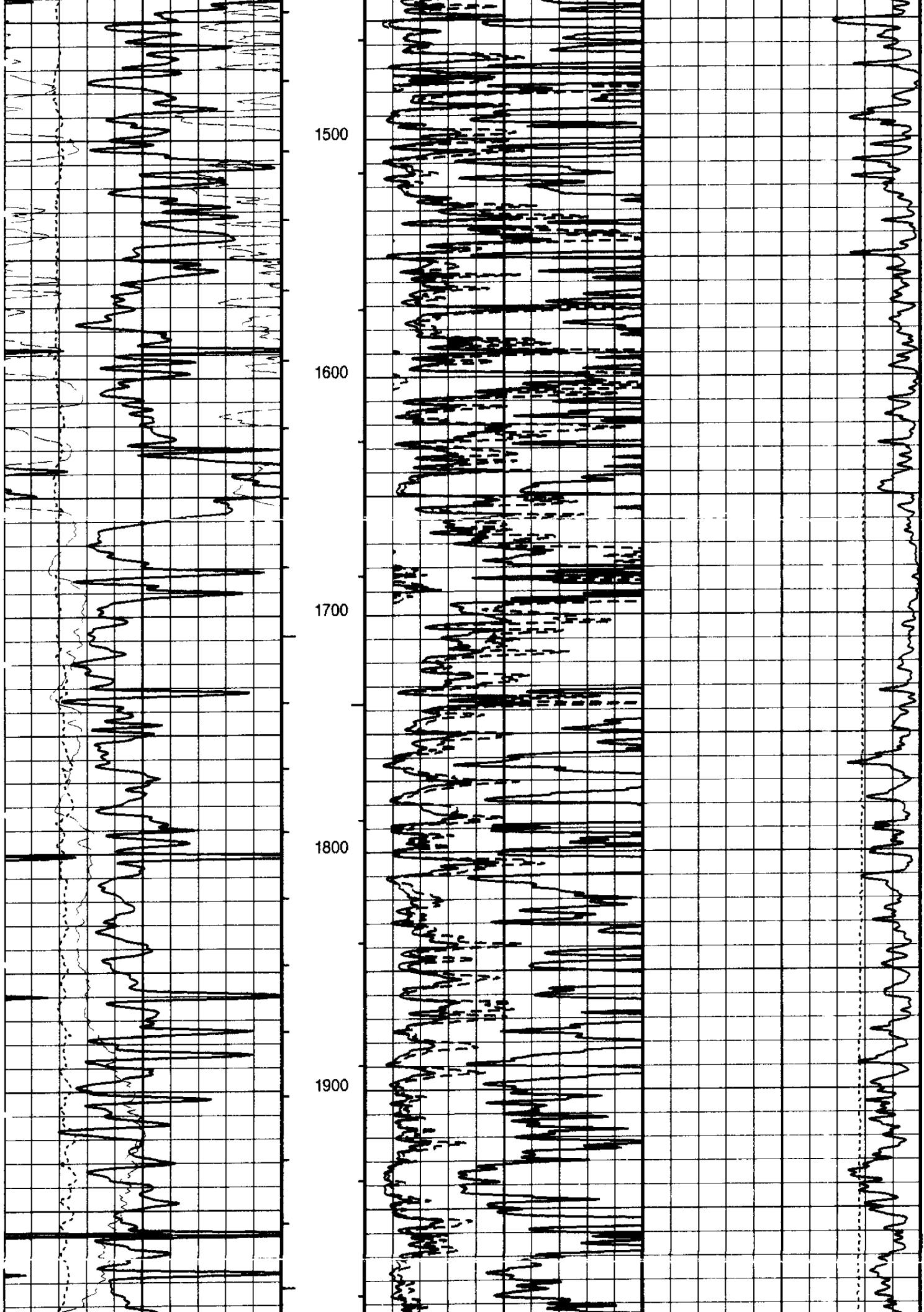
C Time Mark Every 60 S

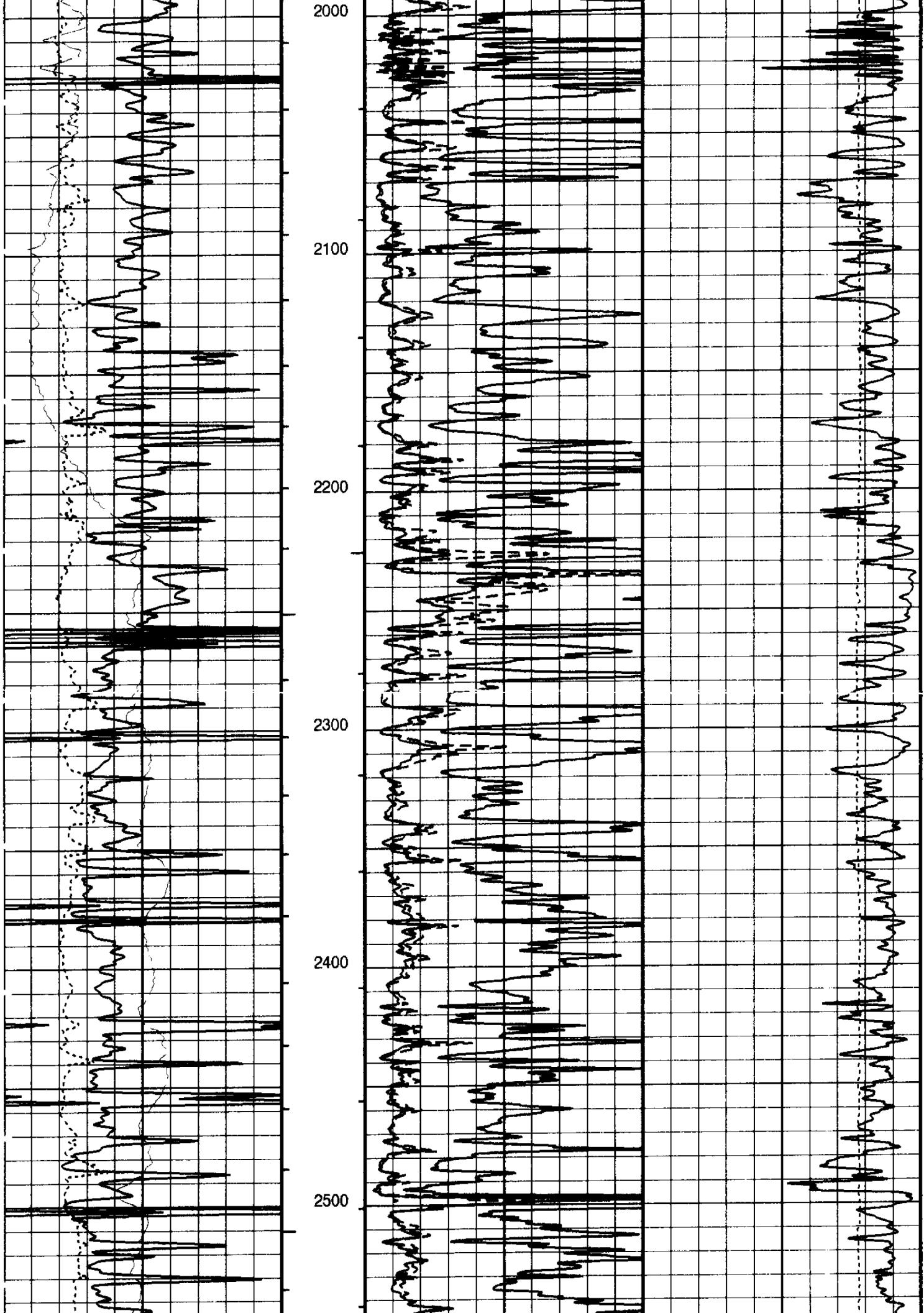
Caliper (HCAL)	16	Tool/Tot. Drag From D3T to STIA	AIT-H 60 Inch Investigation (AHT60) (OHMM)	
Gamma Ray (GR)	200	Cable Drag From STIA to STIT	AIT-H 10 Inch Investigation (AHT10) (OHMM)	Tension (TENS) (LBF) 0
SP (SP)	20	Stuck Stretch (STIT)	AIT-H 10 Inch Investigation (AHT10) (OHMM)	AIT-H 60 Inch Investigation Conductivity (AHTCO60) 500 (MM/M) 0

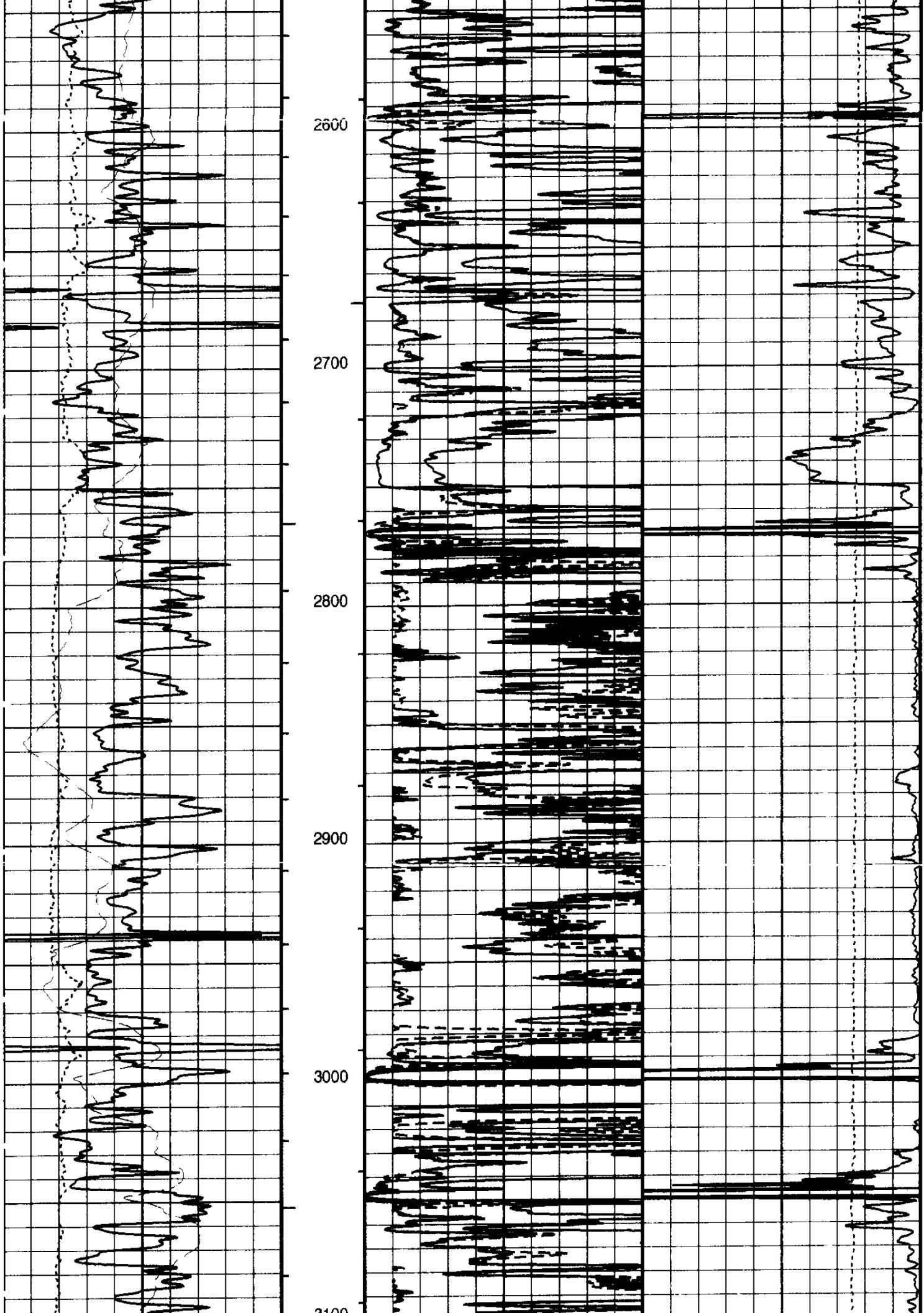


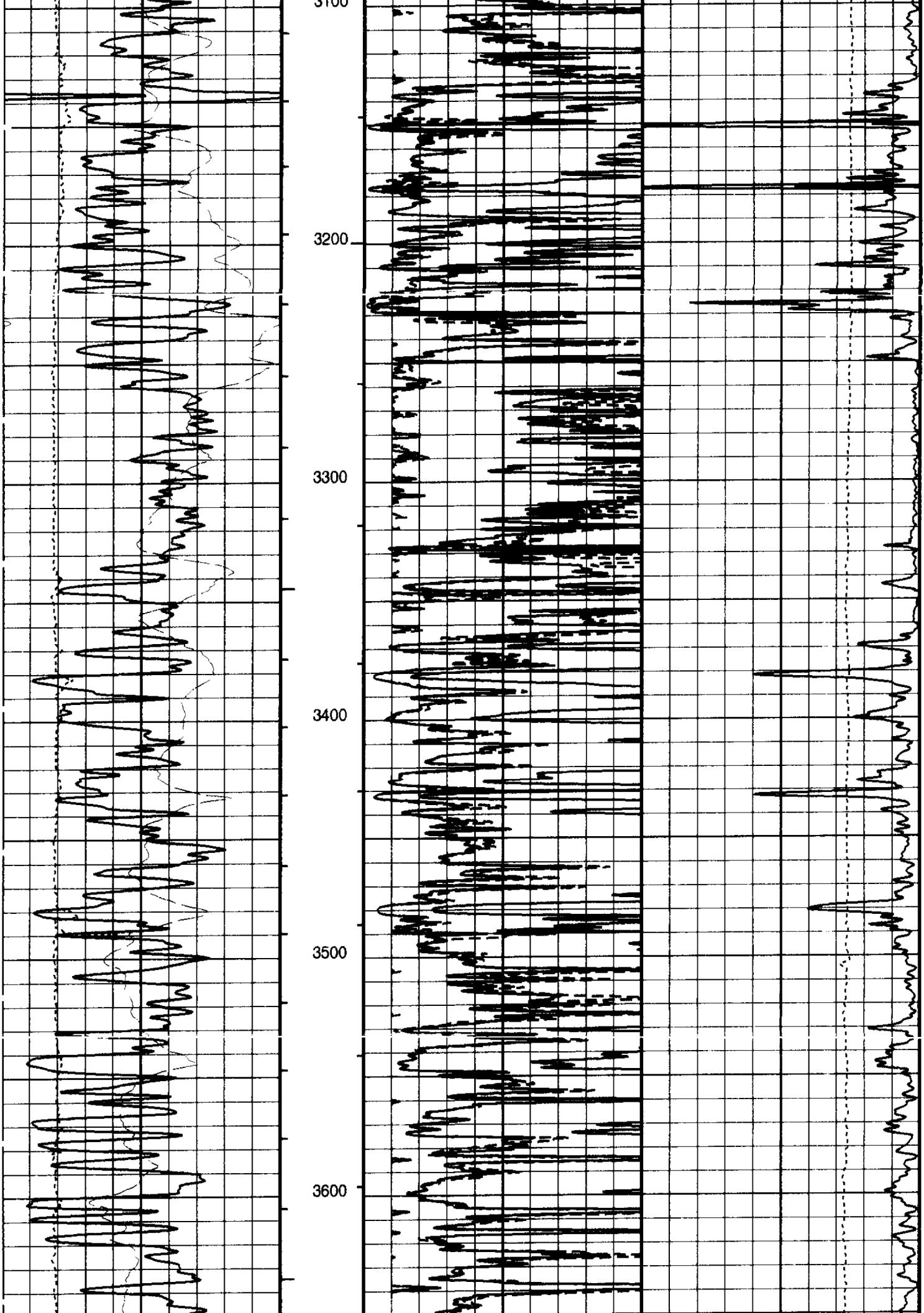


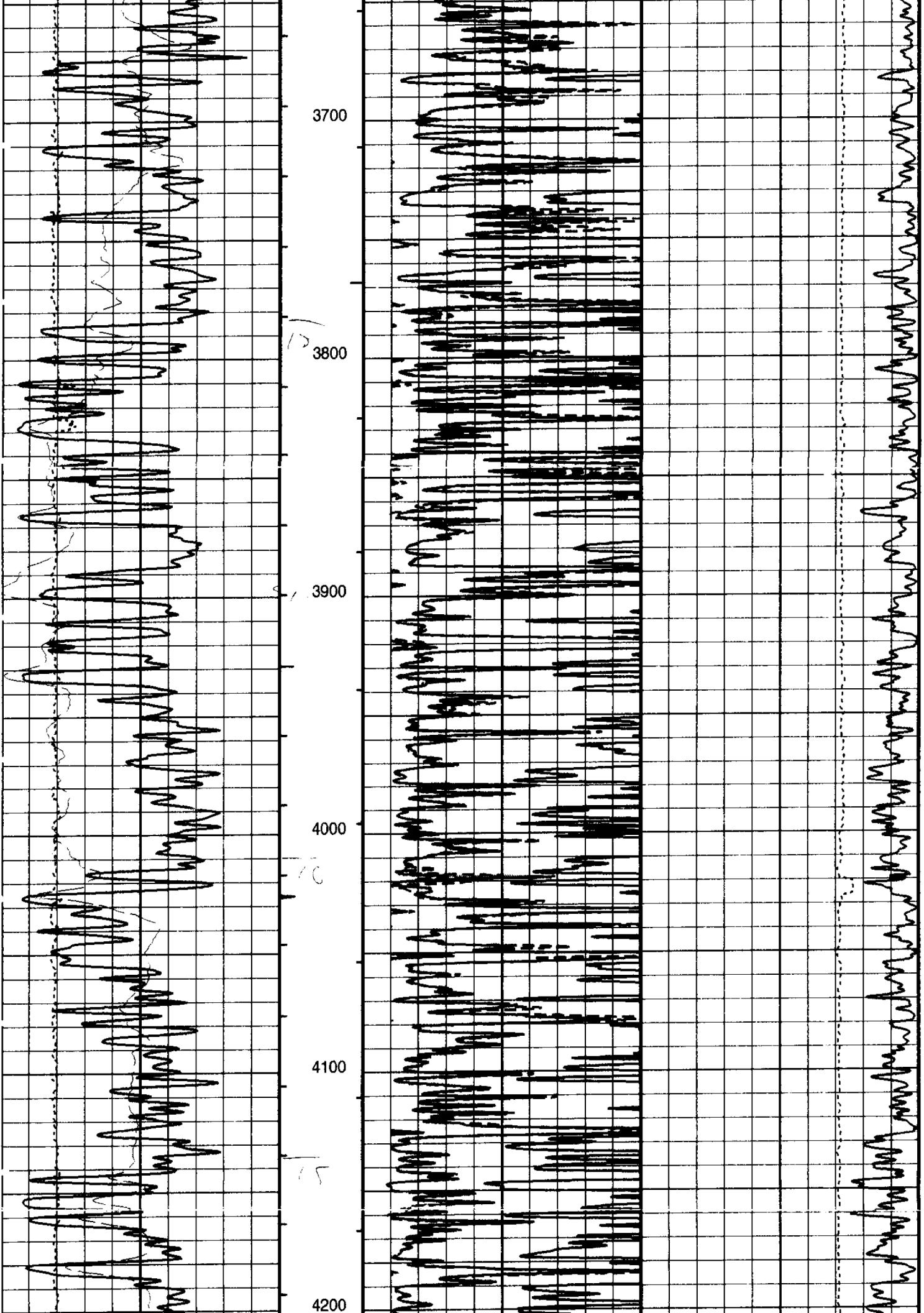


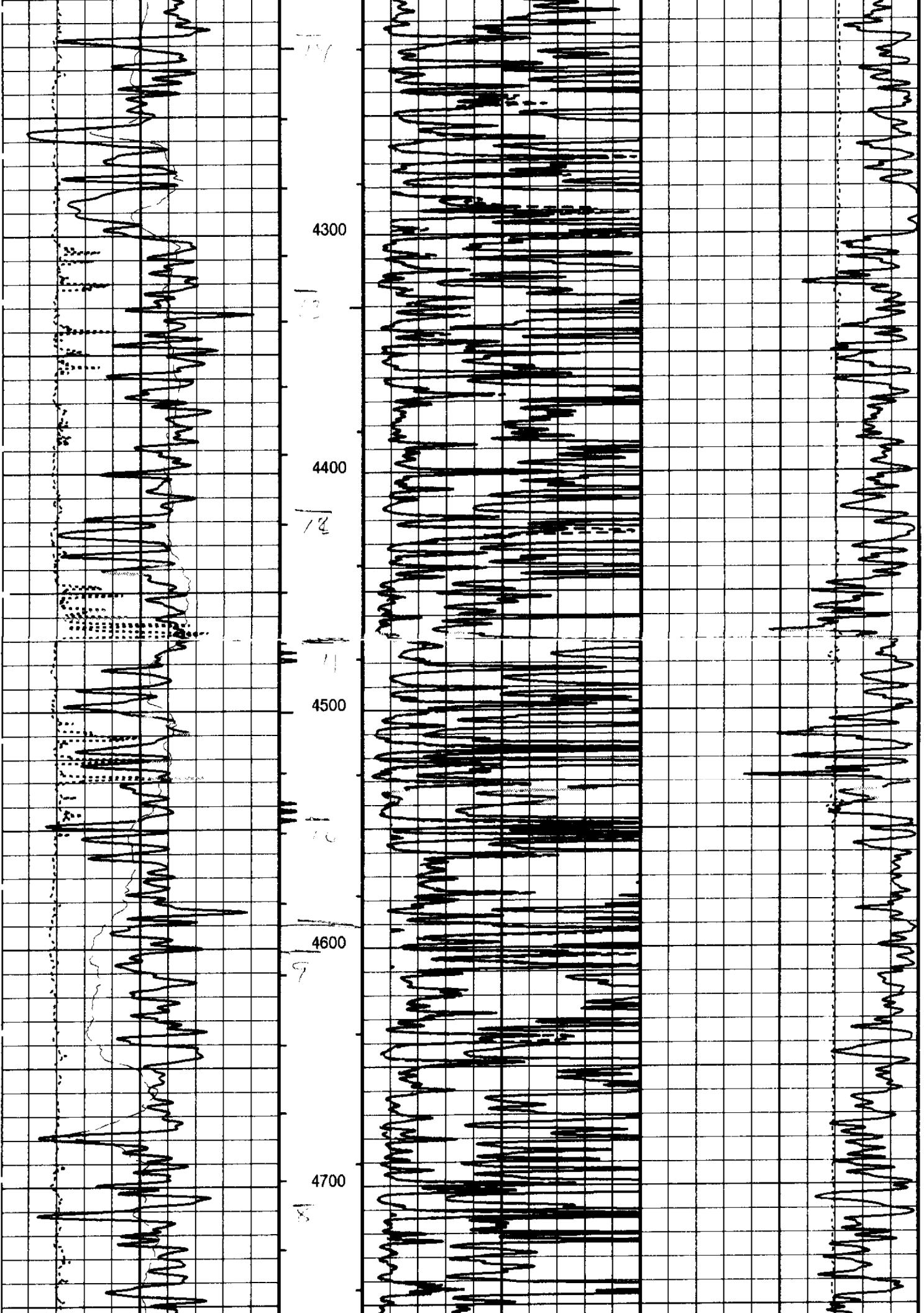


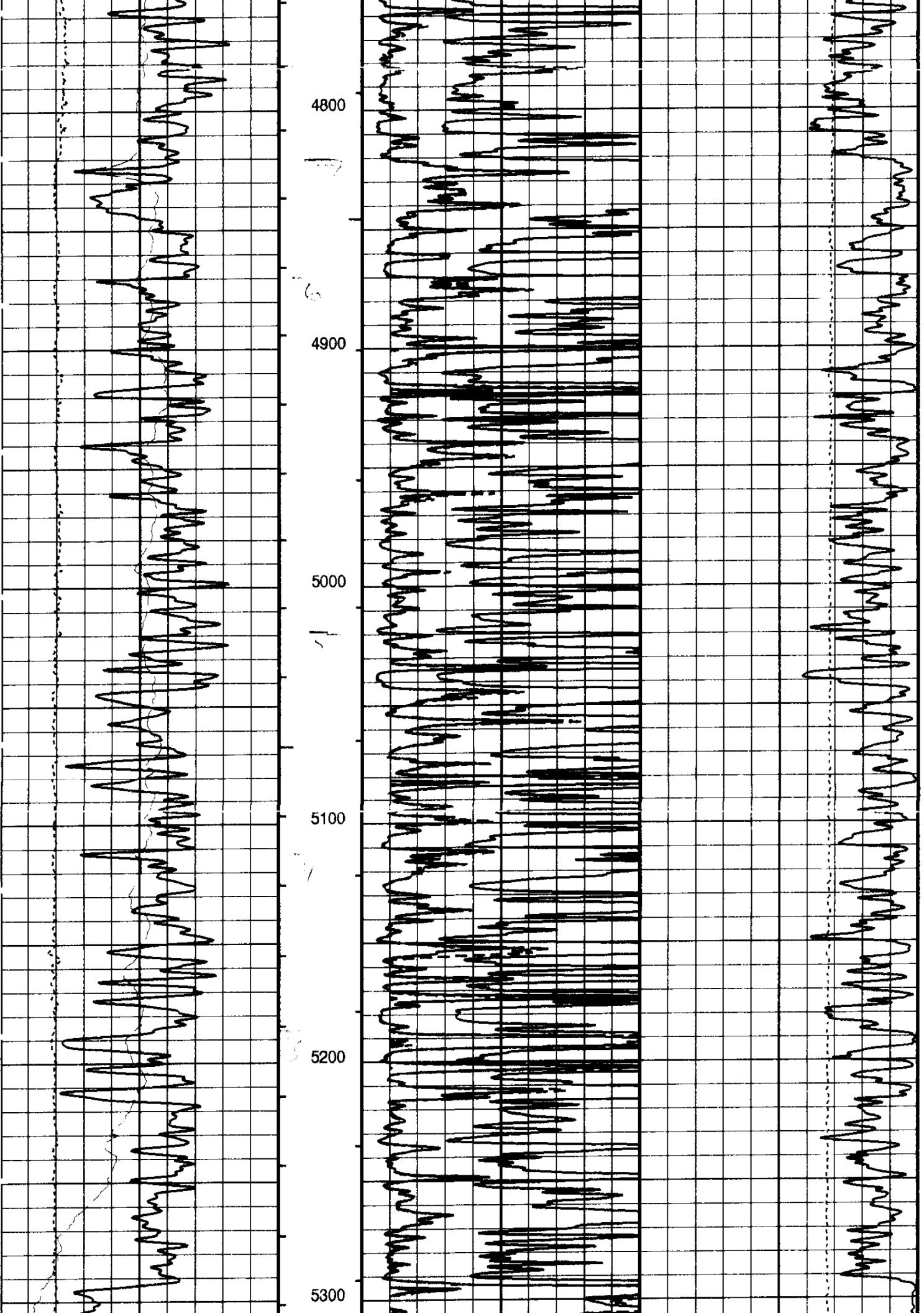


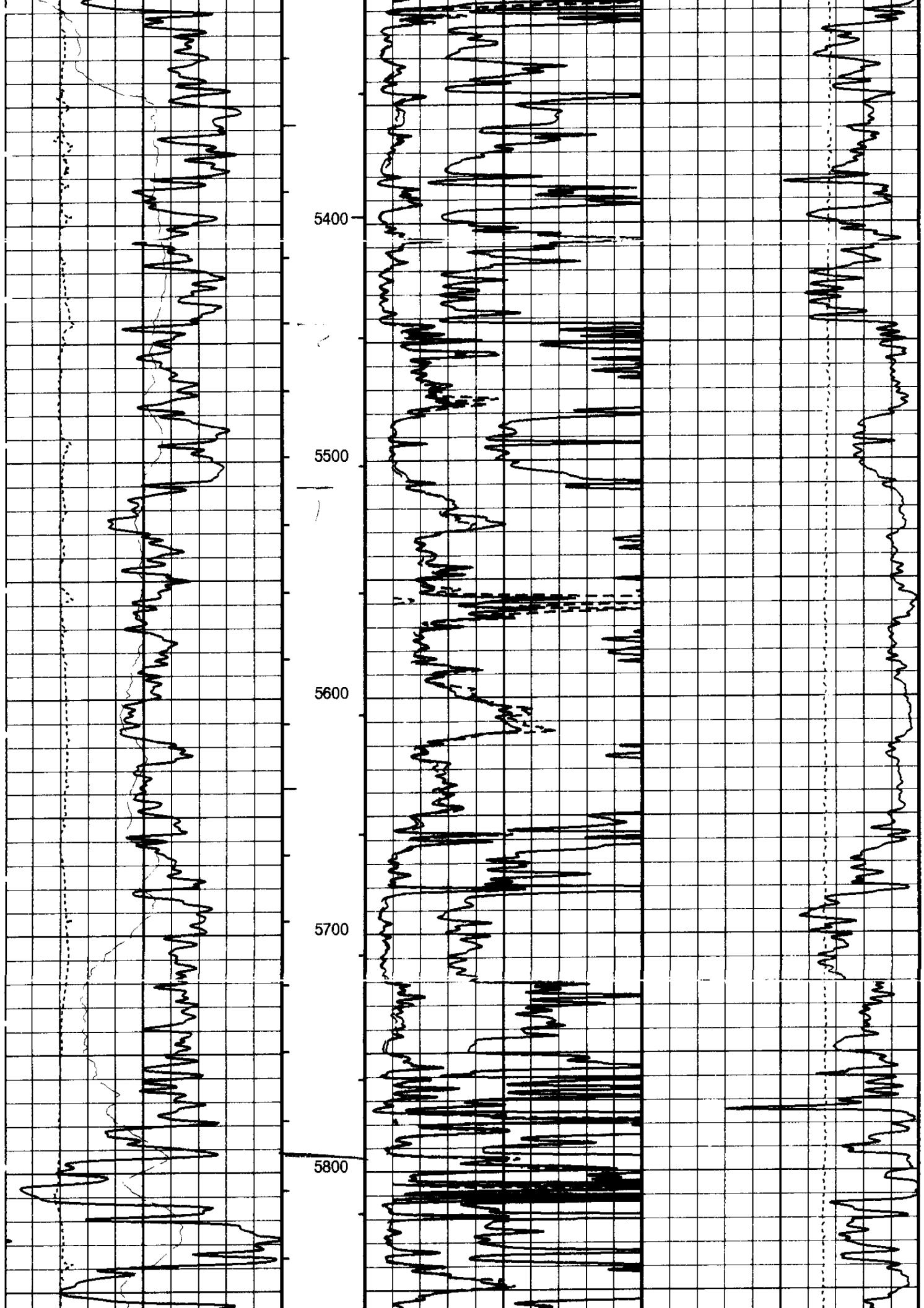


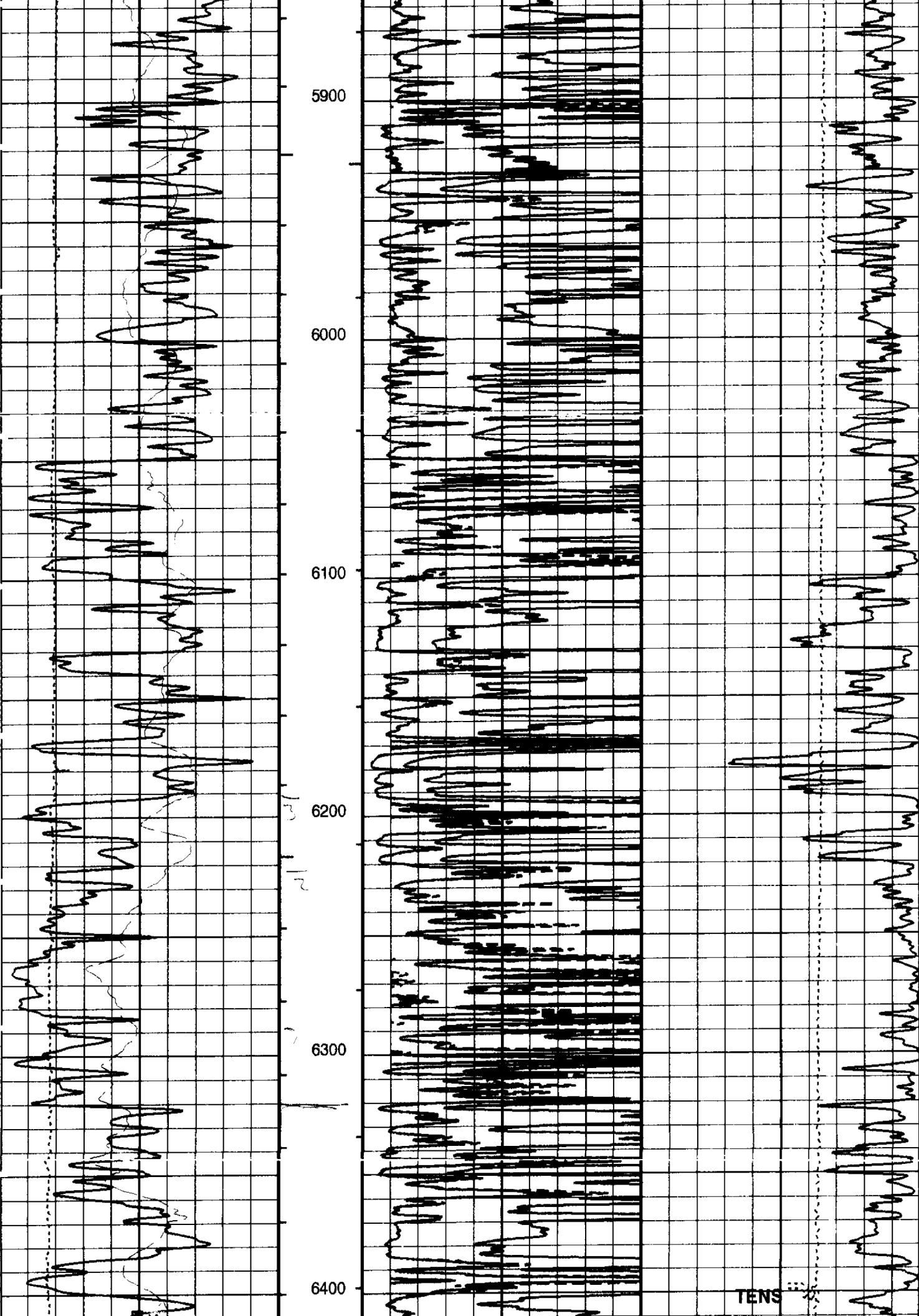




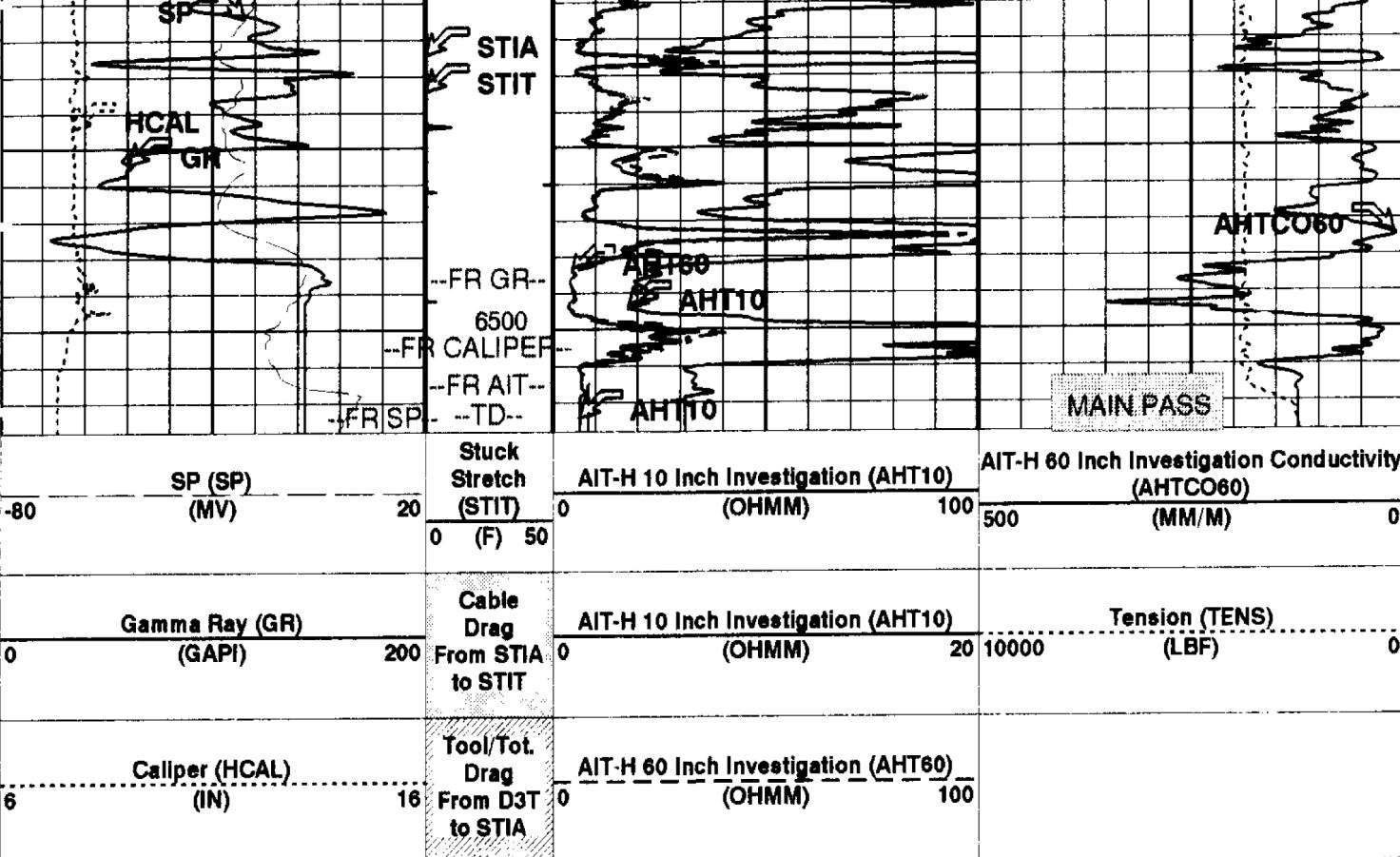








TENS



#### PIP SUMMARY

- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
  - └ Integrated Cement Volume Minor Pip Every 10 F3
  - └ Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

#### Parameters

DLIS Name	Description	Value
AHBHM	AIT-H Bhole Correction Mode	2_ComputeStandoff
AHCDE	AIT-H Casing Detection Enable	Yes
AHCEN	AIT-H Tool Centering Flag (in Borehole)	Eccentered
AHCSDF	AIT-H Casing Shoe Estimated Depth	-50000
AHMRF	AIT-H Mud Resistivity Factor	1
AHSTA	AIT-H Tool Standoff	1.125
BHT	Bottom Hole Temperature (used in calculations)	136
BS	Bit Size	7.875
DFD	Drilling Fluid Density	8.60
DORL	Depth Offset Repeat Analysis	0.0
FEXP	Form Factor Exponent	2
FNUM	Form Factor Numerator	1
GCSE	Generalized Caliper Selection	HCAL
GDEV	Average Angular Deviation of Borehole from Normal	0
GGRD	Geothermal Gradient	1.000000e-02
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE
HMPCO	HILT RTSC Measure points correction	NO
HSCM	HILT Speed Correction Mode	TSCD_SpeedCorrect
HSTI	STI Uses HILT Acceleration	YES
MST	Mud Sample Temperature	49.00
SHT	Surface Hole Temperature	49
SPNV	SP Next Value	0
STKT	STI Stuck Threshold	2.5
TD	Total Depth	6524

Format: AIT\_BasicLinTwo Vertical Scale: 2" per 100'

Graphics File Created: 31-OCT-1996 18:30

OP System Version: 7C0-427  
DBM

HILTB-CTS  
HOLEV

RPCVX-680  
RPCVX-680

ALLRES  
PERT

RPCVX-680  
RPCVX-680

# Output DLIS Files

DEFAULT	HILTC .004	FN:3	FIELD	31-OCT-1996 18:30
REDUCED	HILTC .004	FN:4	CUST	31-OCT-1996 18:30

# Output DLIS Files

DEFAULT	HILTC .004	FN:3	FIELD	31-OCT-1996 18:30	6528.0 FT	-7.5 FT
REDUCED	HILTC .004	FN:4	CUST	31-OCT-1996 18:30		

## Integrated Hole/Cement Volume Summary

Hole Volume = 2179.93 F3

Cement Volume = 1173.97 F3 (assuming 5.50 IN casing O.D.)

Computed from 6524.0 FT to 427.0 FT using data channel(s) HCAL

MAIN PASS

## OP System Version: 7C0-427

DBM

HILT-B-CTS	RPCVX-680	ALLRES	RPCVX-680
HOLEV	RPCVX-680	PERT	RPCVX-680

### PIP SUMMARY

- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
  - Integrated Cement Volume Minor Pip Every 10 F3
  - Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

	Tension (TENS)	
10000	(LBF)	0

### Caliper (HCAL)

6	(IN)	16
---	------	----

### AIT-H 90 Inch Investigation (AHT90)

0.2	(OHMM)	2000
-----	--------	------

### Gamma Ray (GR)

0	(GAPI)	200
---	--------	-----

### AIT-H 60 Inch Investigation (AHT60)

0.2	(OHMM)	2000
-----	--------	------

### SP (SP)

-80	(MV)	20
-----	------	----

Tool/Tot.  
Drag  
From D3T  
to STIA

### AIT-H 30 Inch Investigation (AHT30)

0.2	(OHMM)	2000
-----	--------	------

### AIT-H Outer Invasion Diameter (AHTD2)

0	(IN)	90
---	------	----

Cable  
Drag  
From STIA  
to STIT

### AIT-H 20 Inch Investigation (AHT20)

0.2	(OHMM)	2000
-----	--------	------

### AIT-H Inner Invasion Diameter (AHTD1)

0	(IN)	90
---	------	----

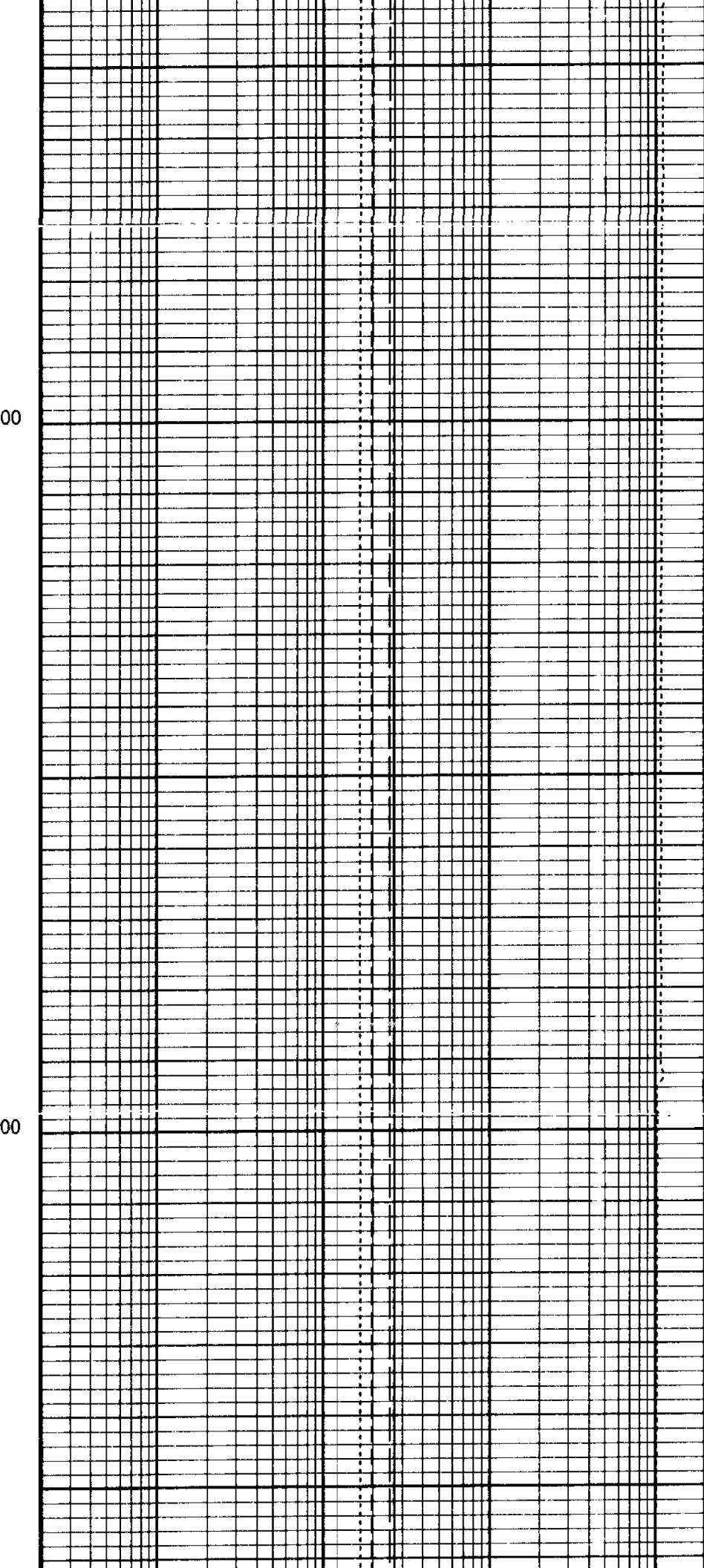
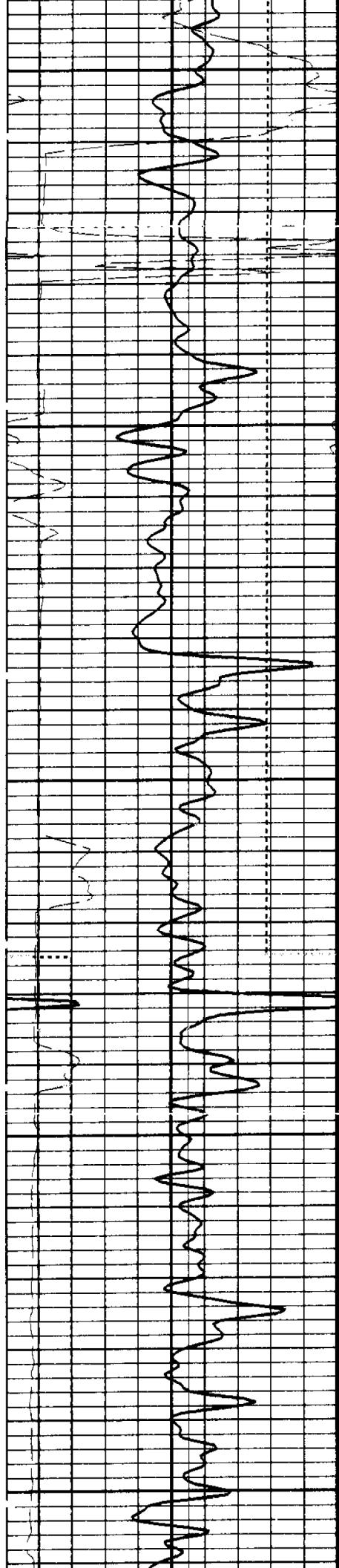
Stuck  
Stretch  
(STIT)

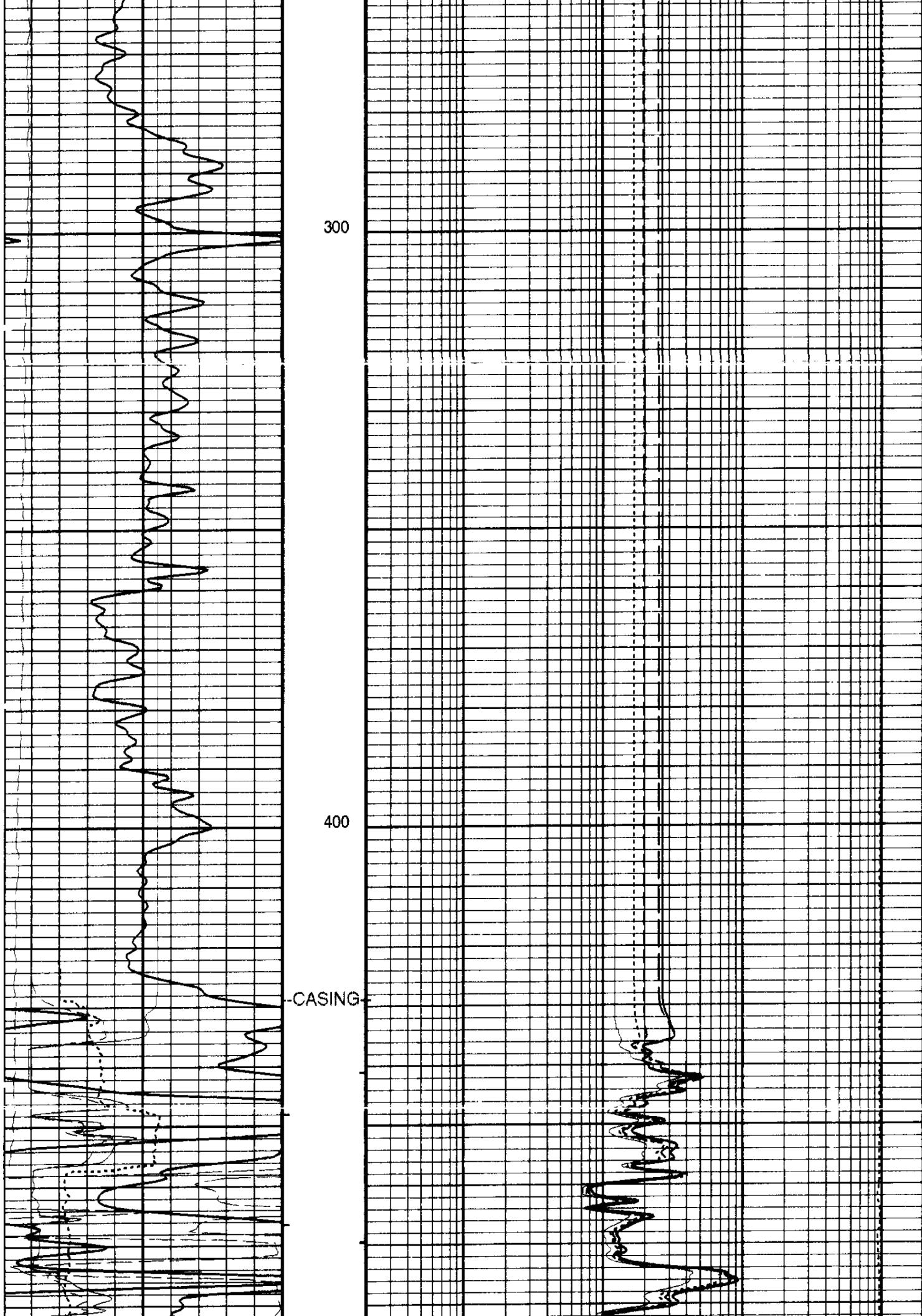
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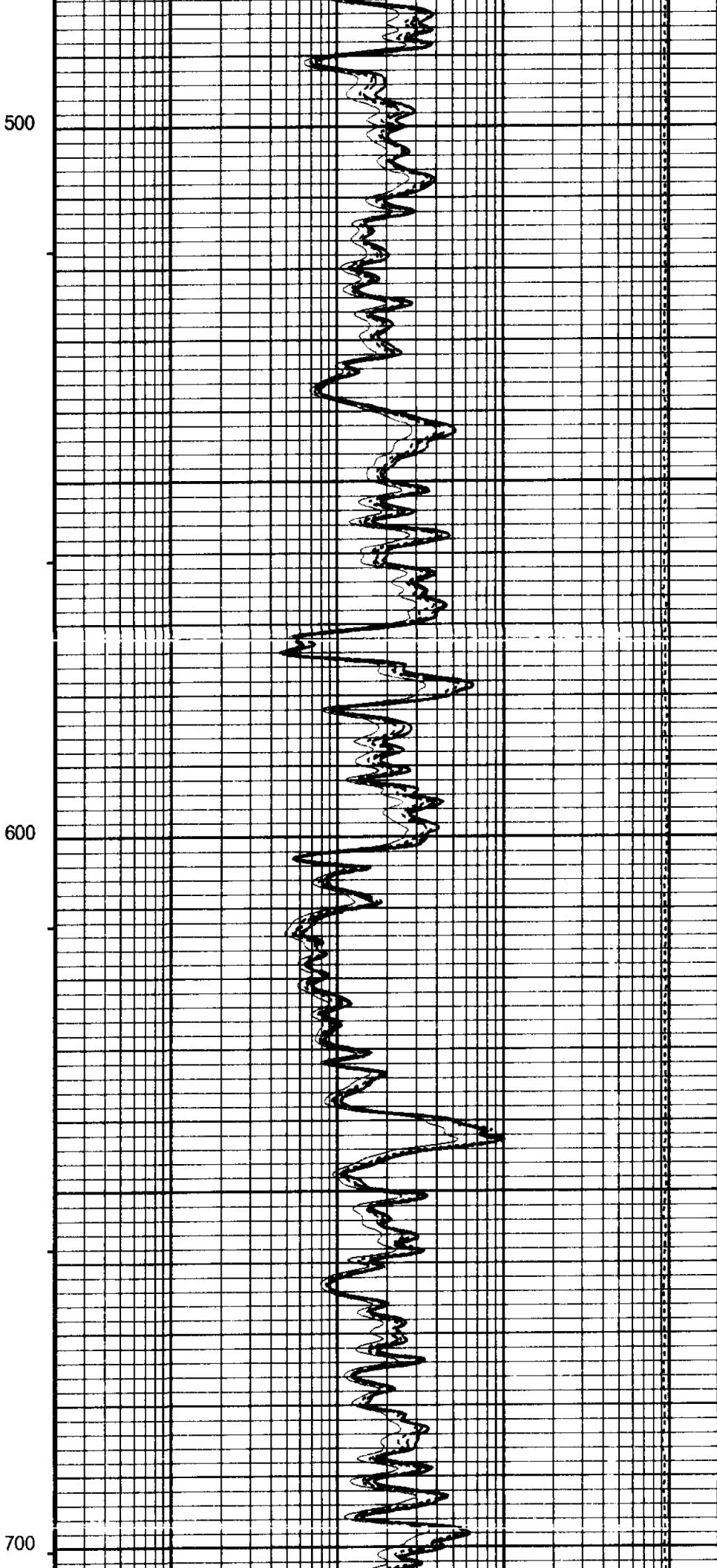
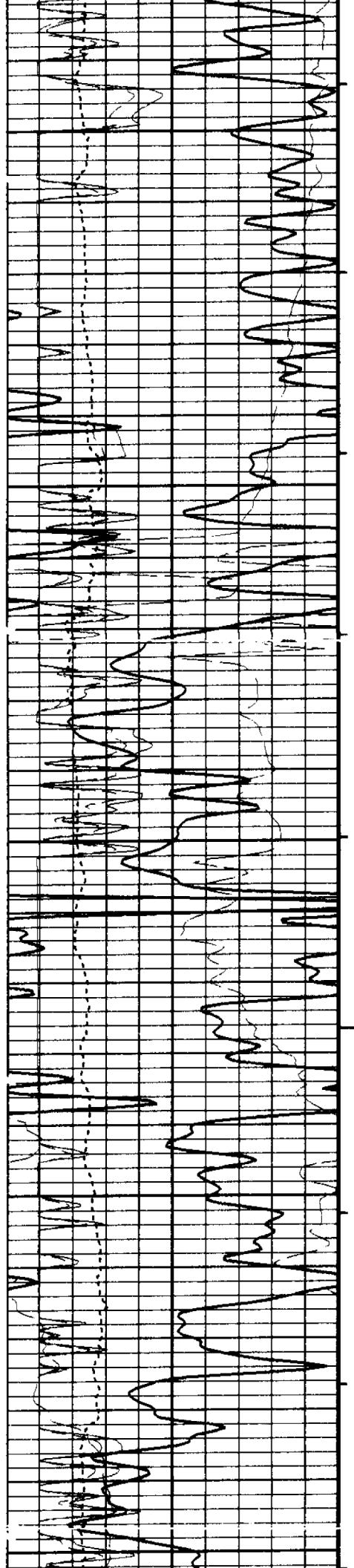
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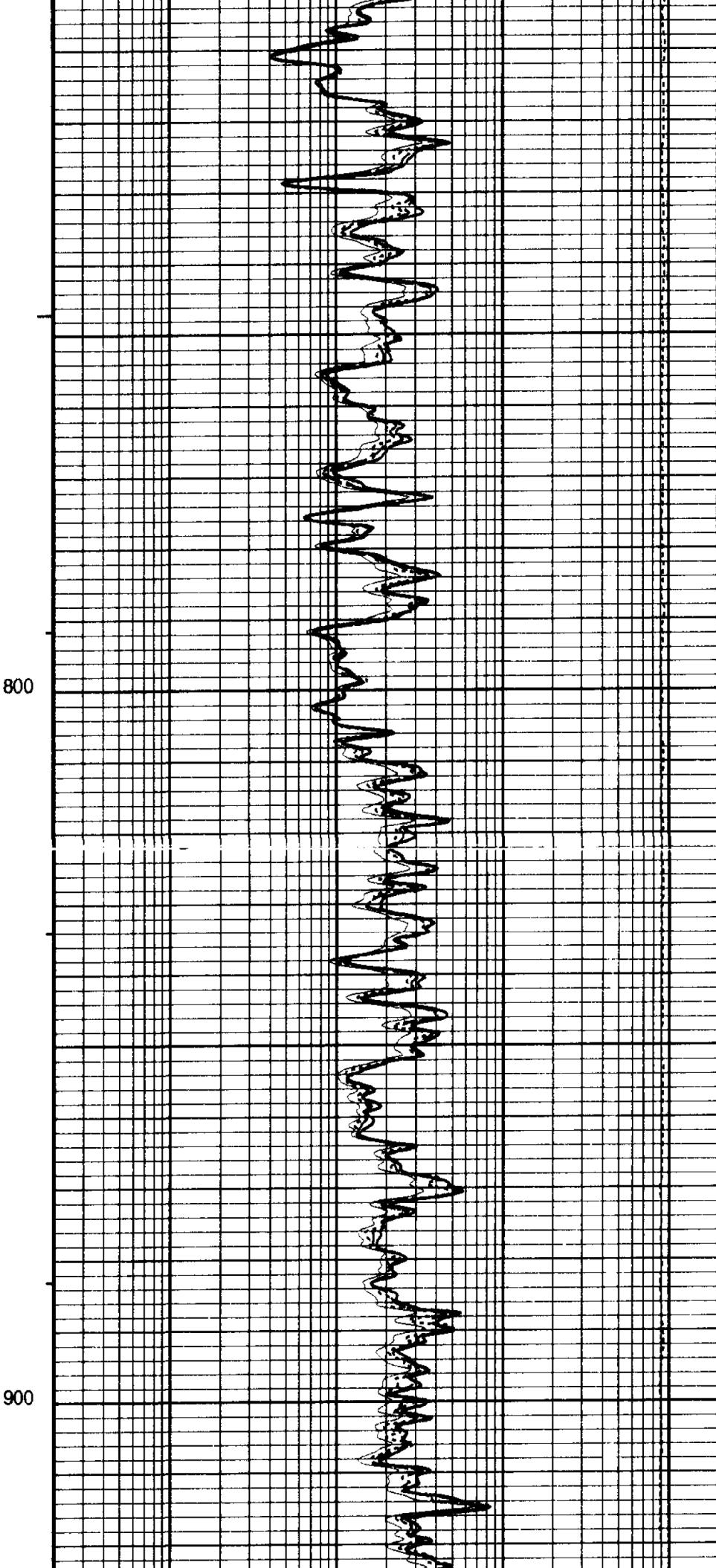
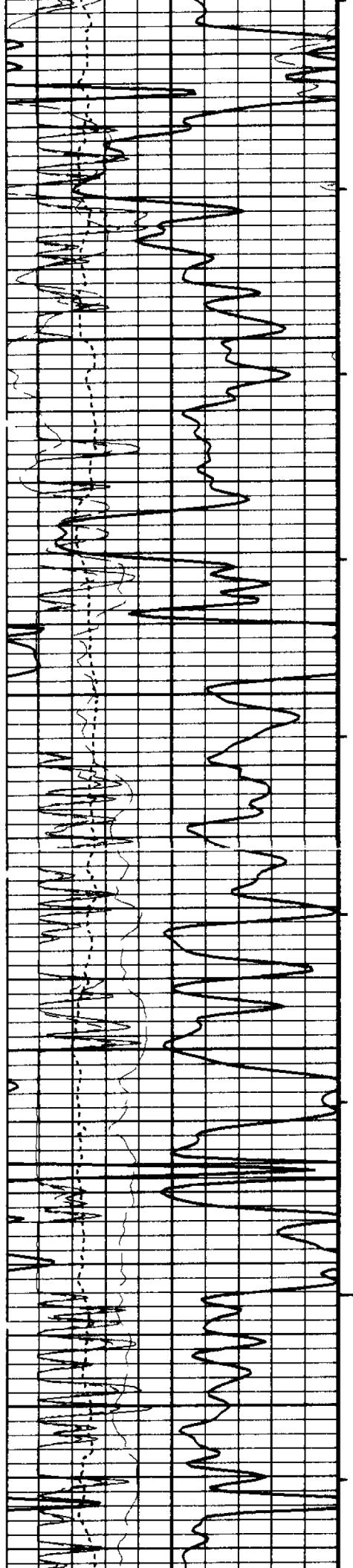
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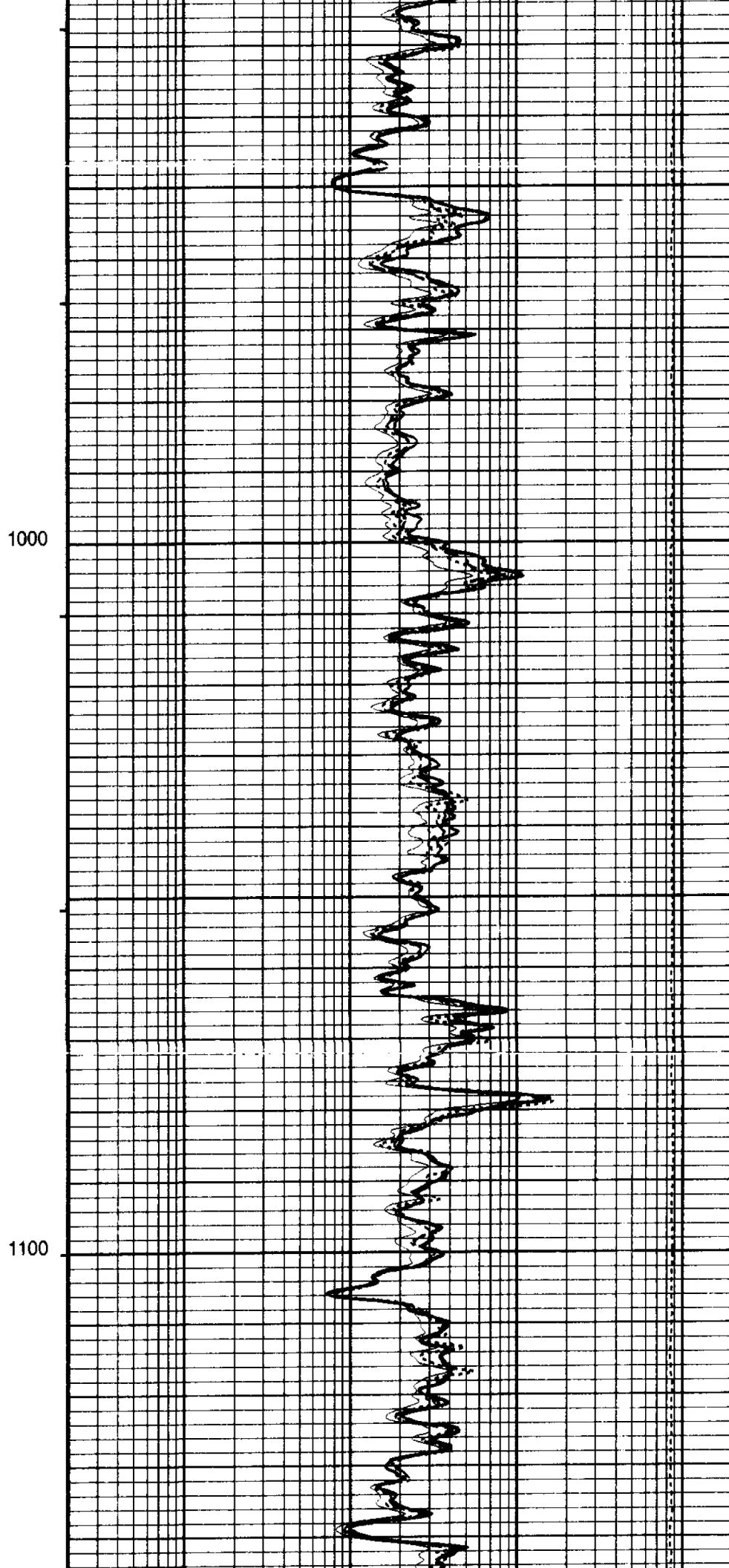
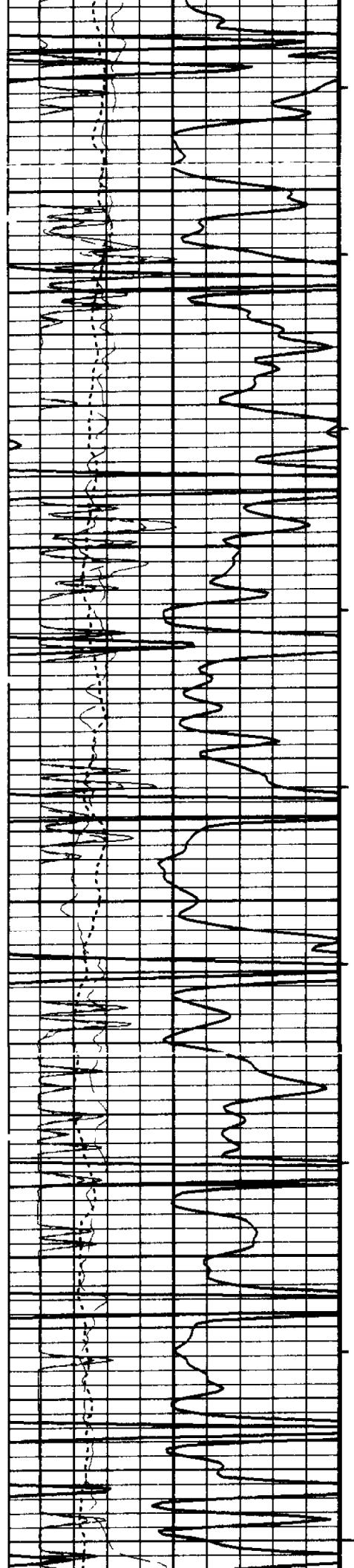
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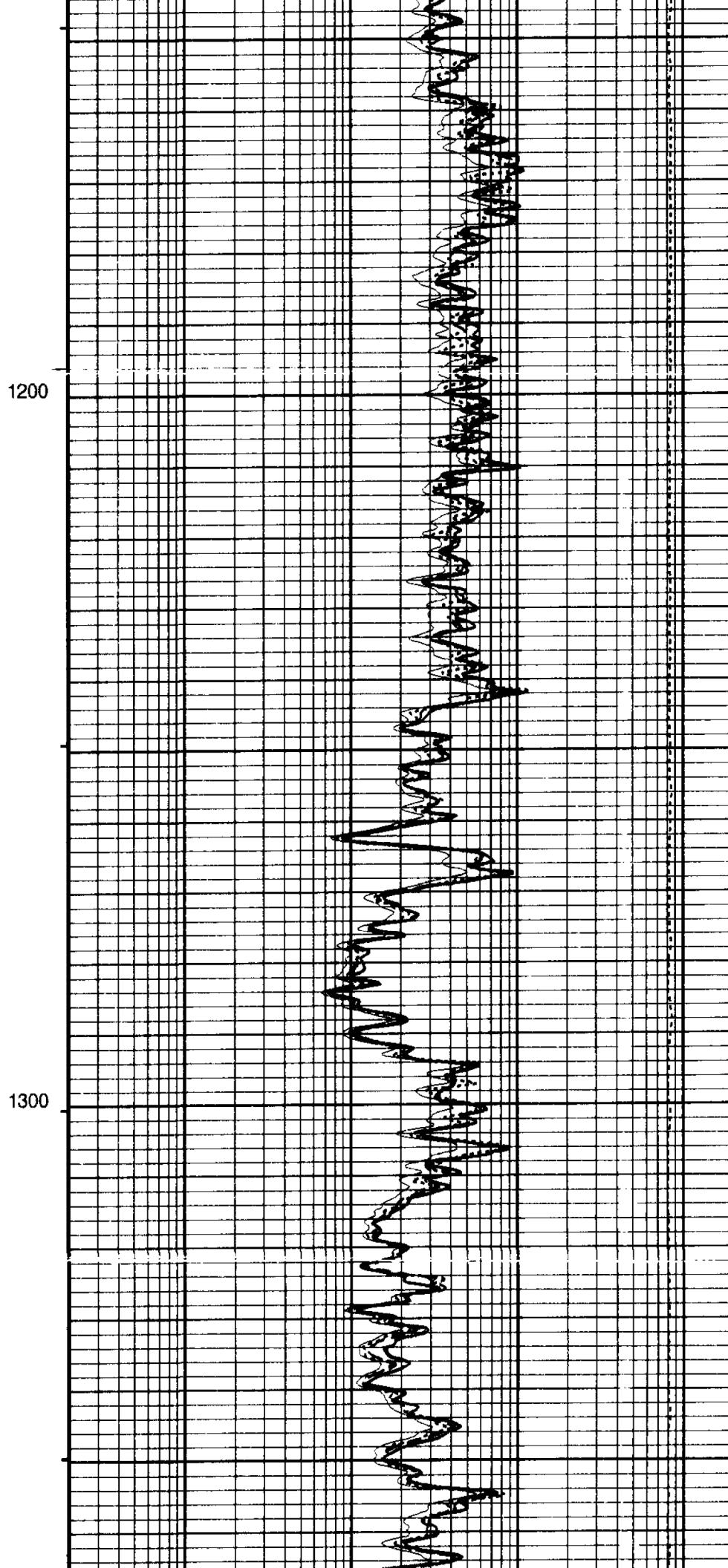
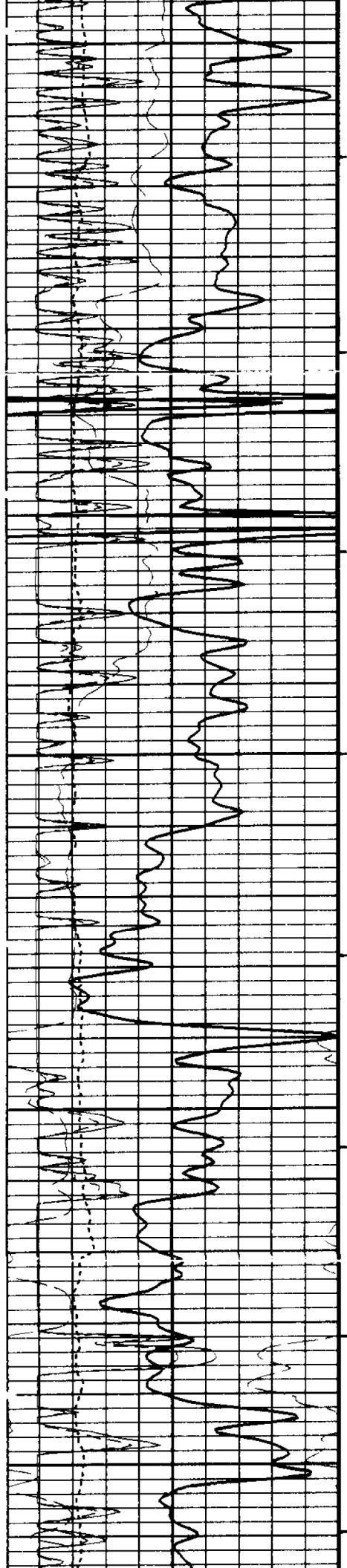


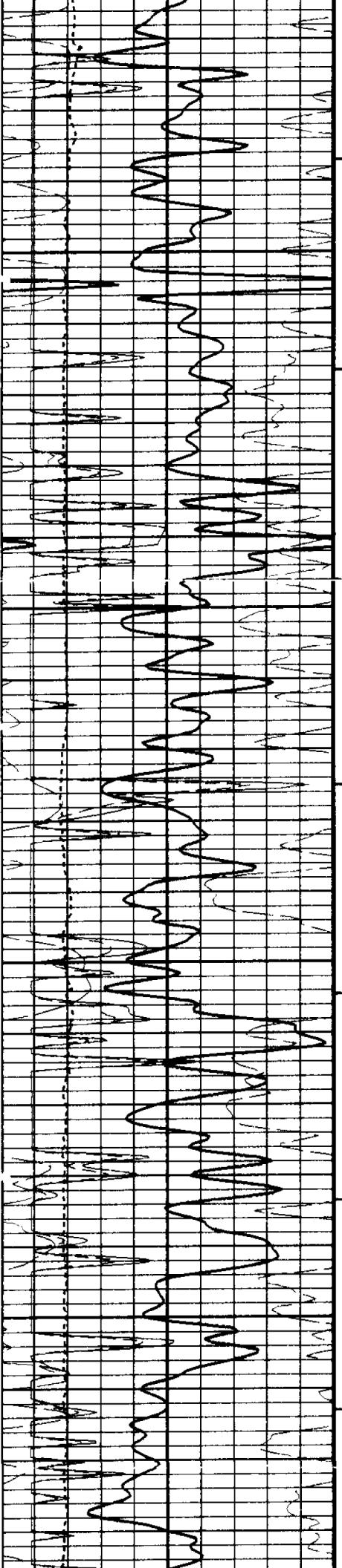






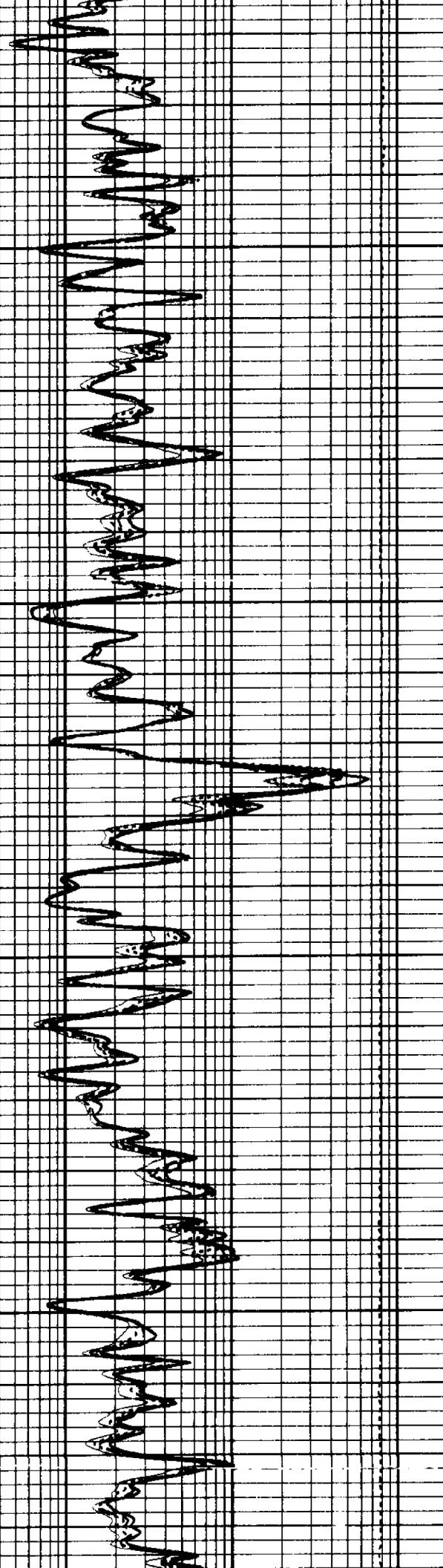


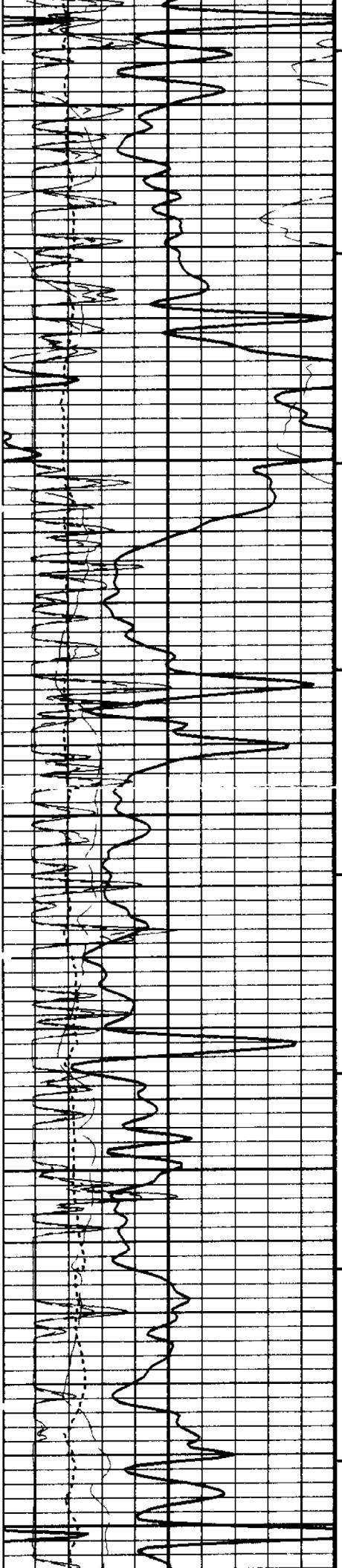




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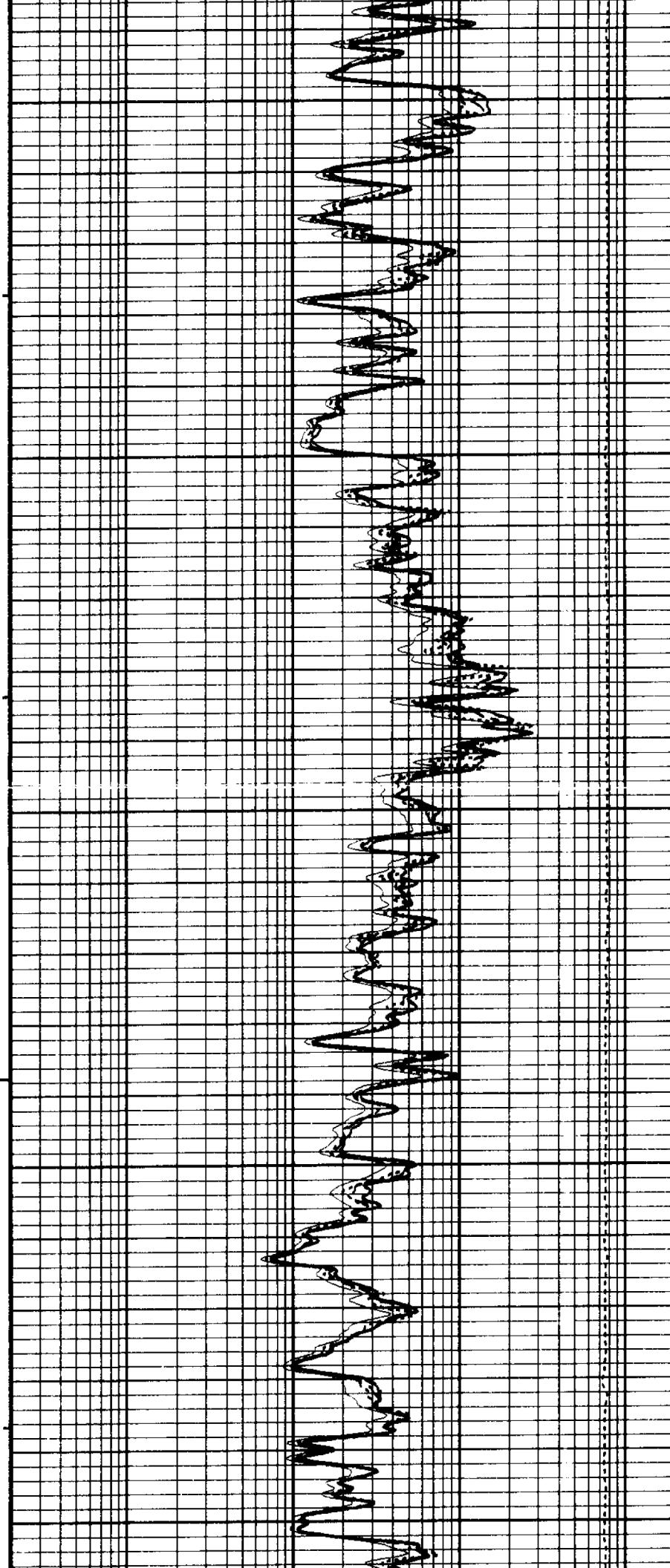


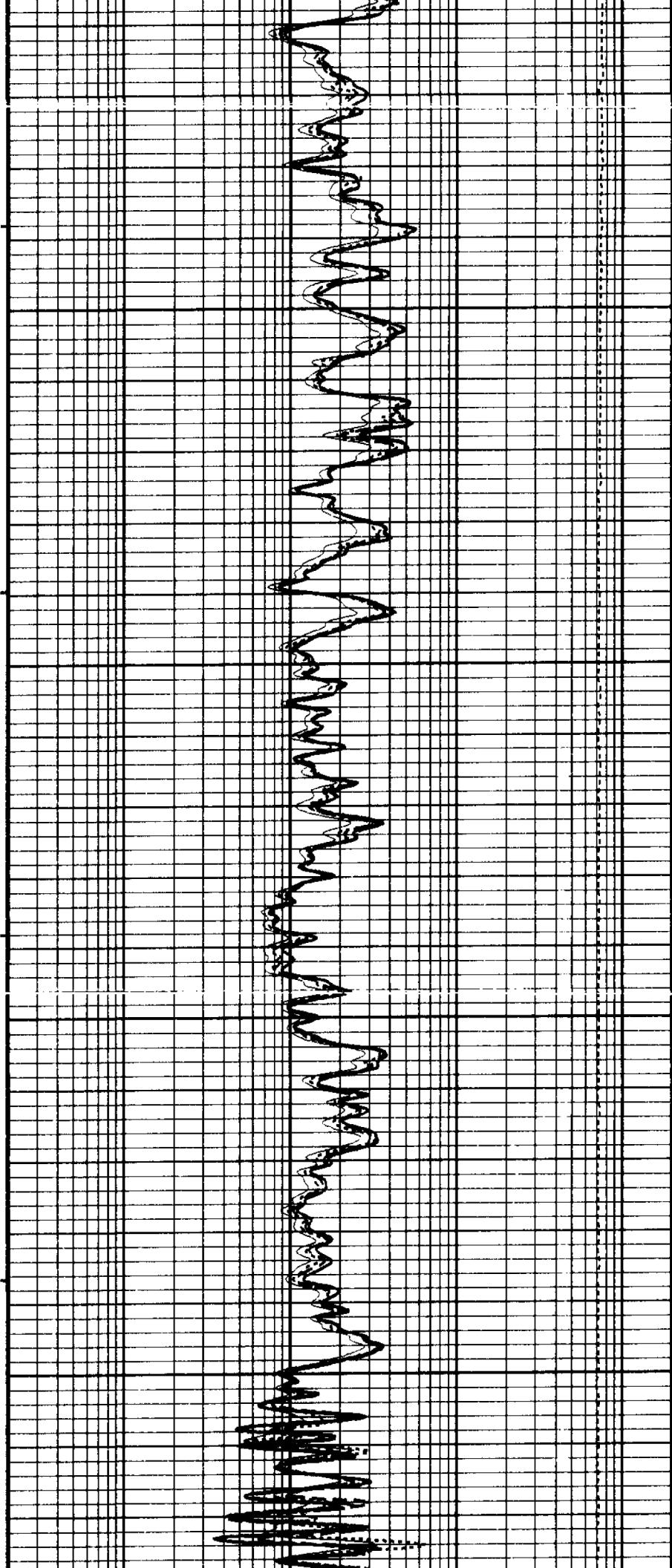
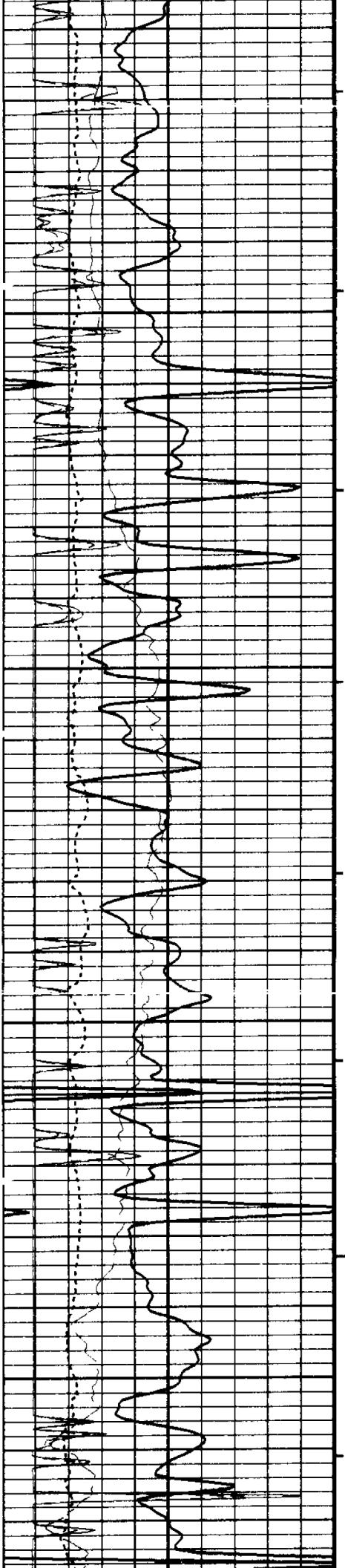


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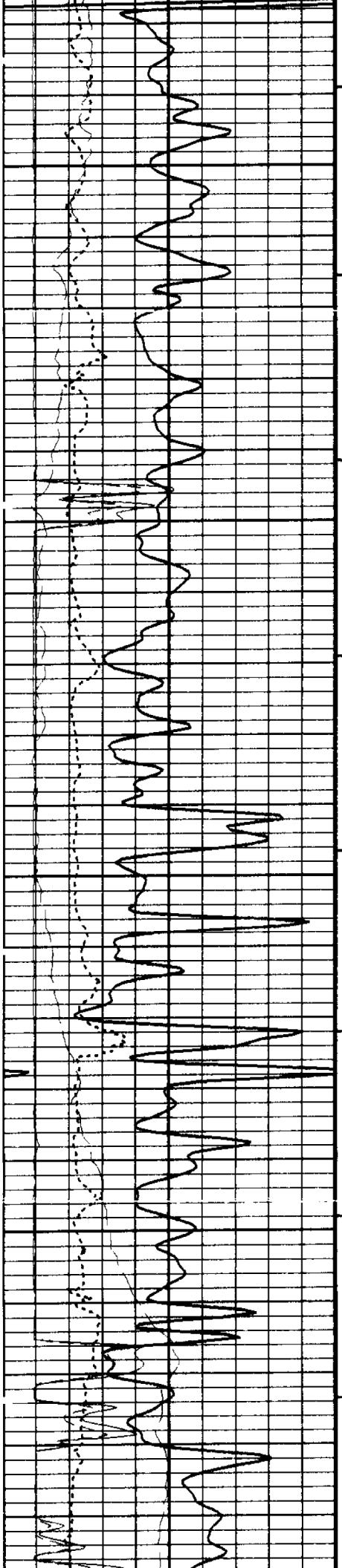
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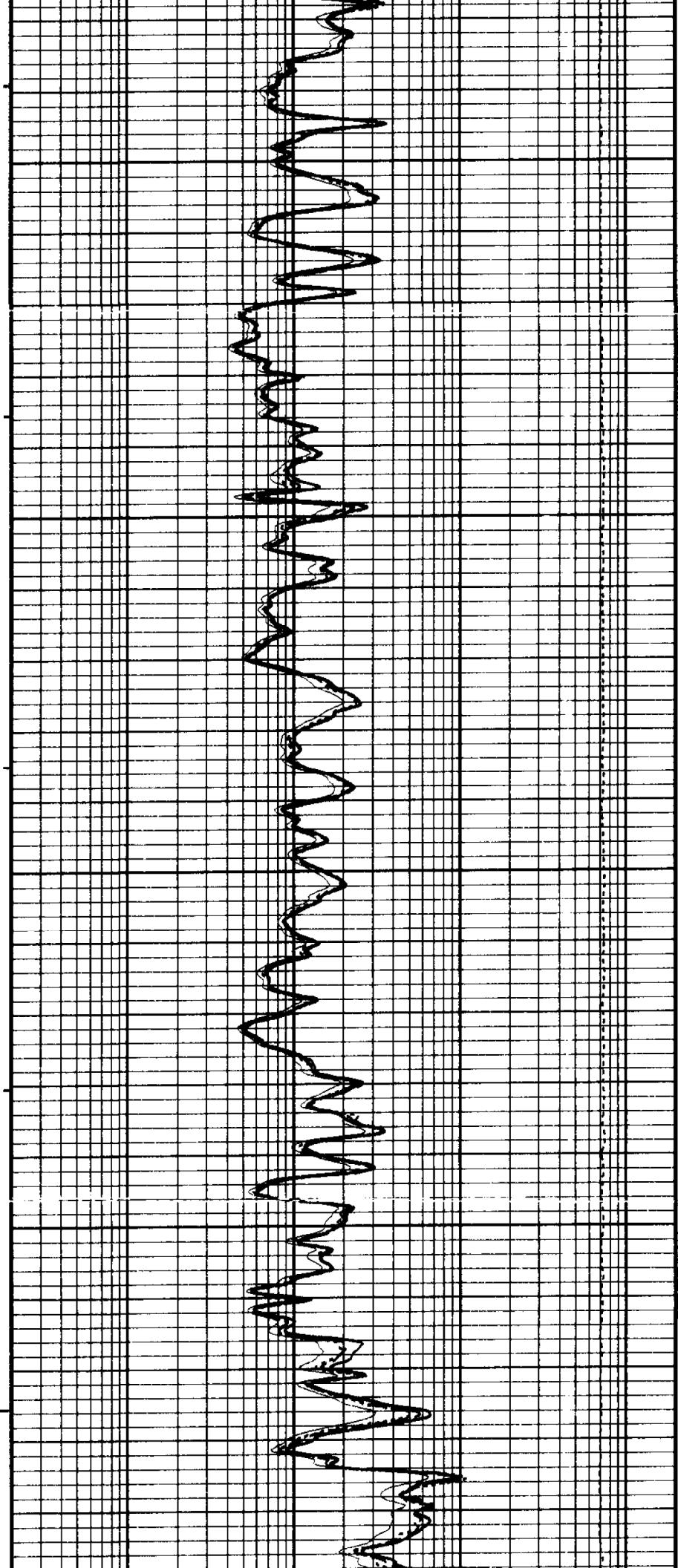
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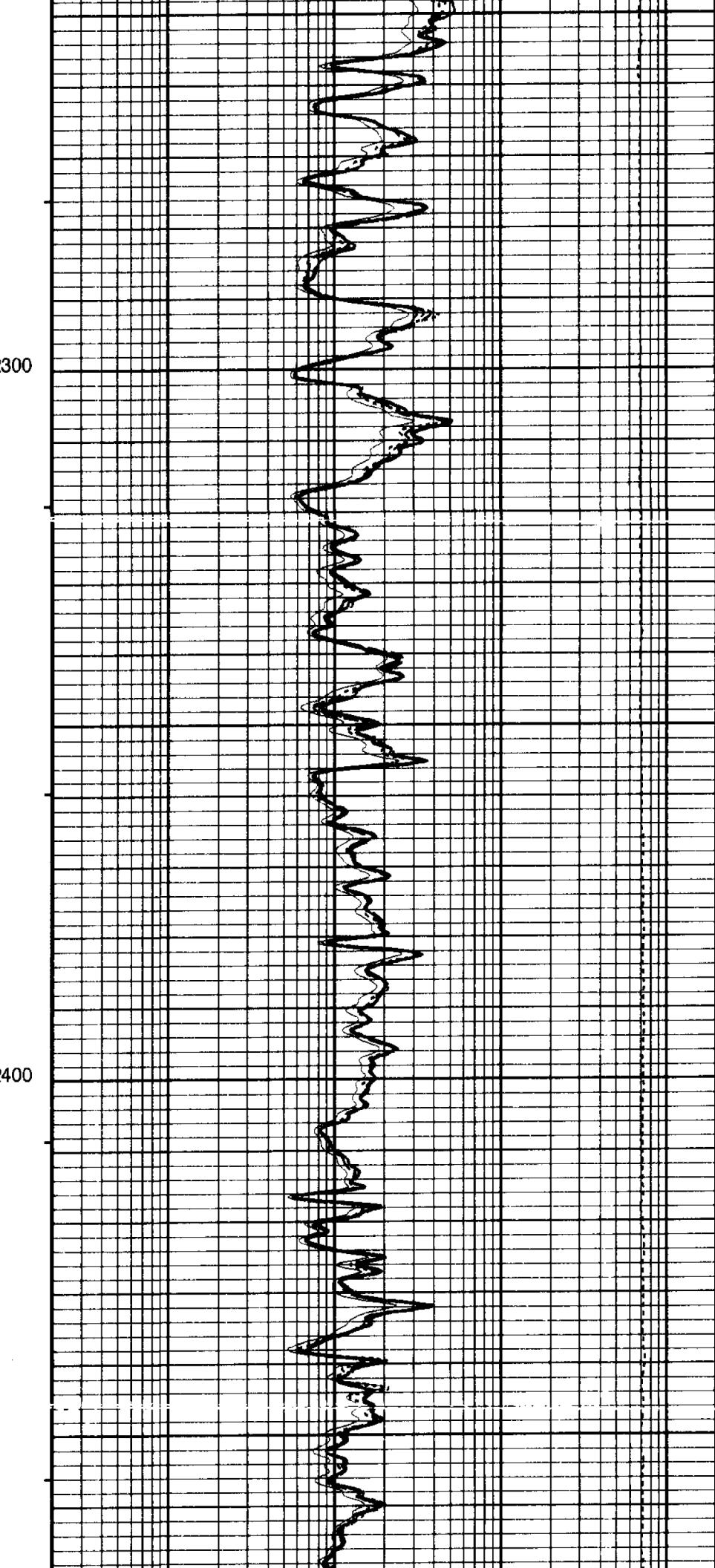
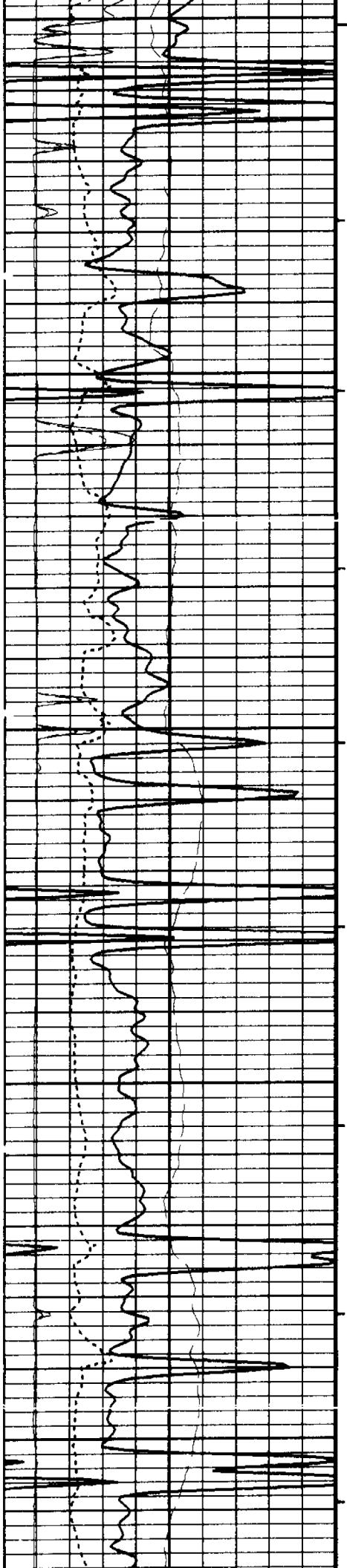
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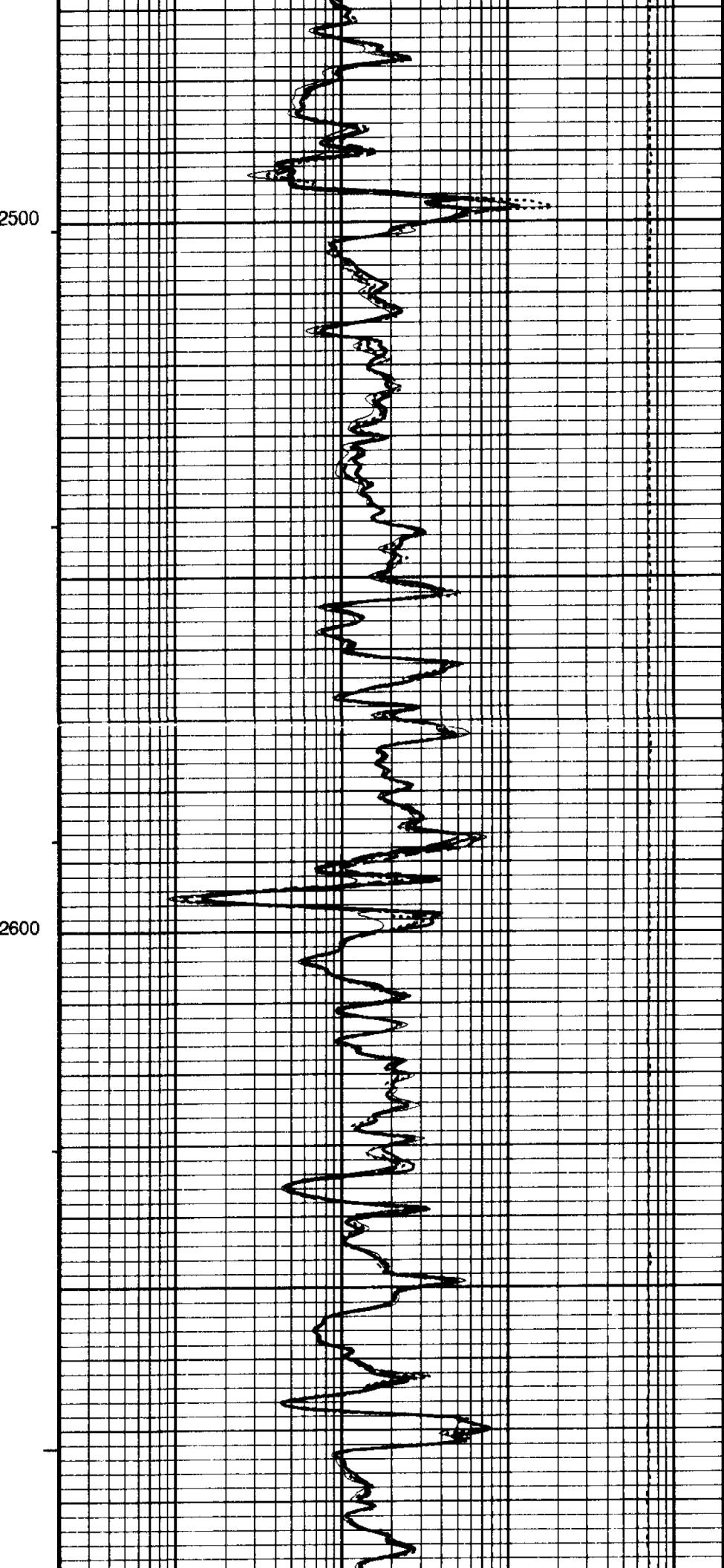
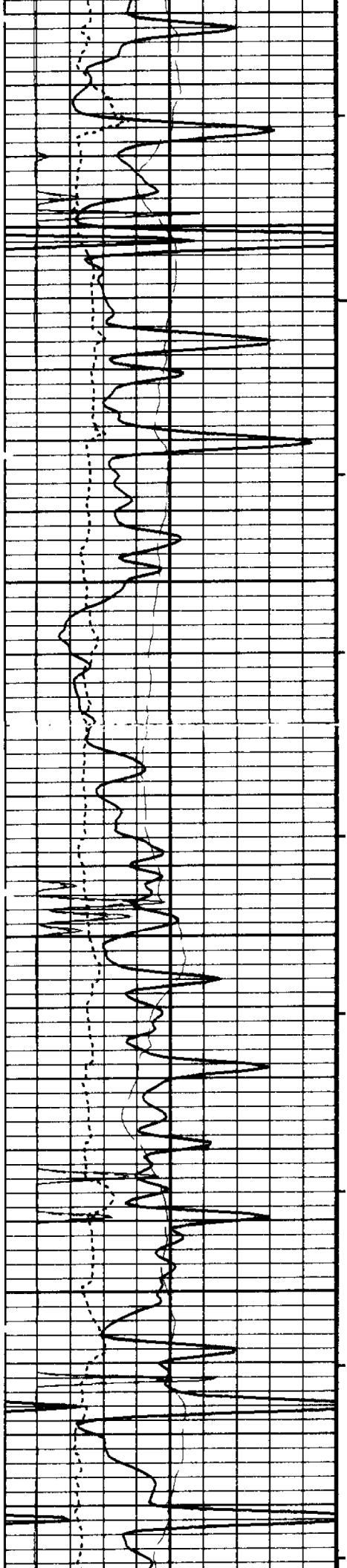


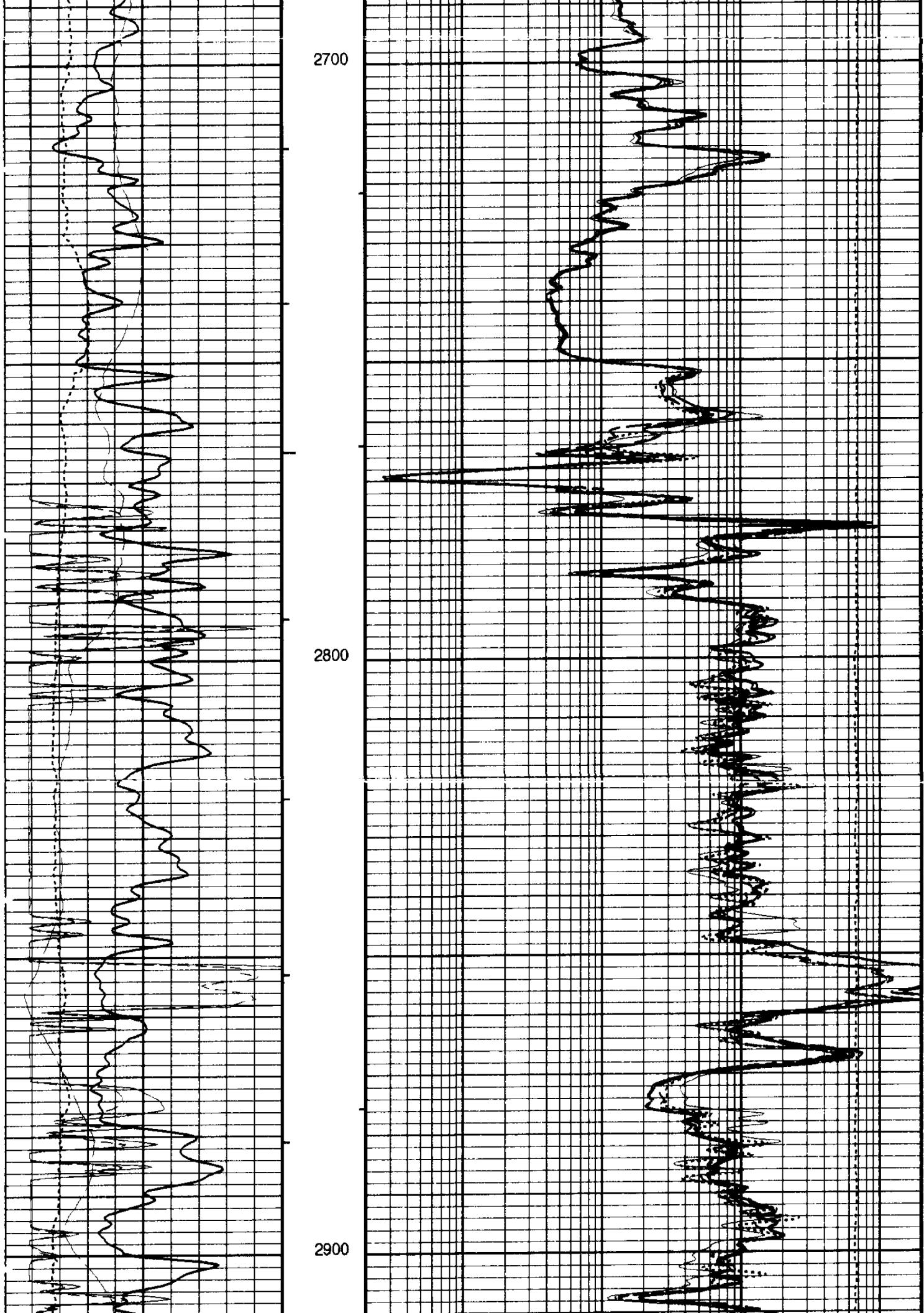
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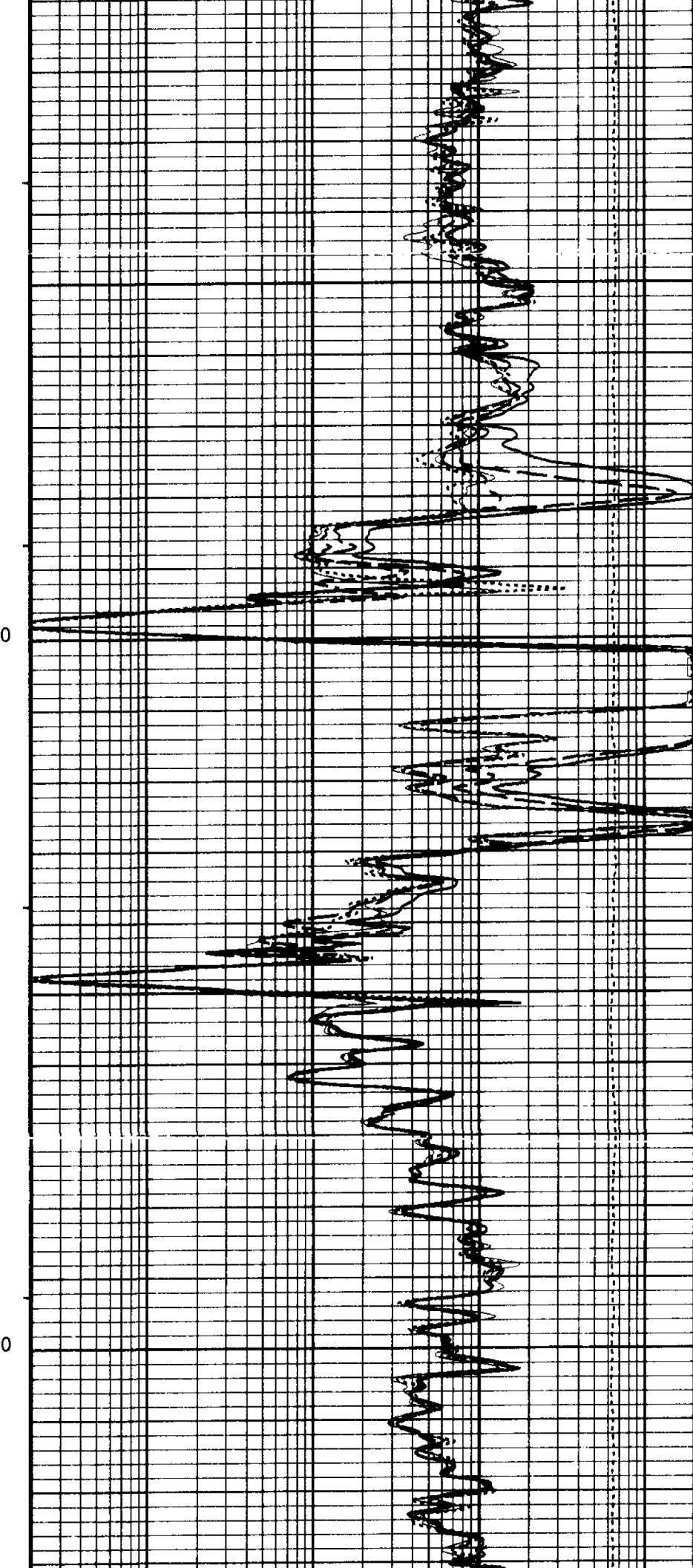
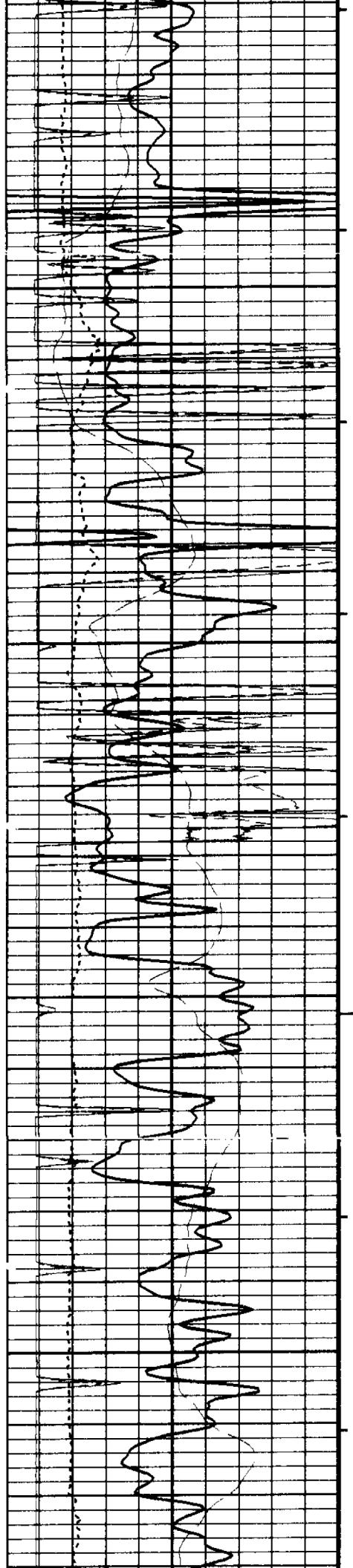
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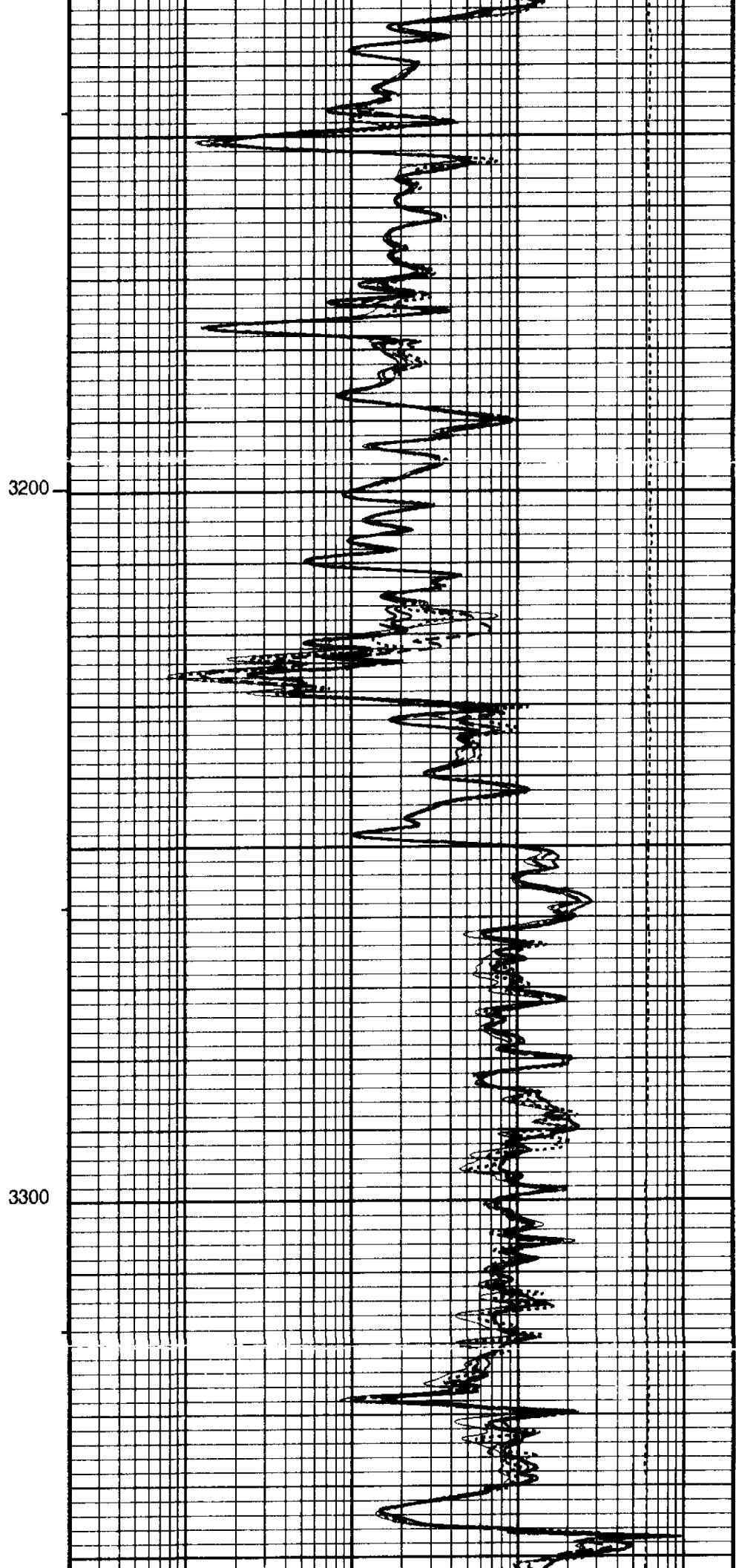
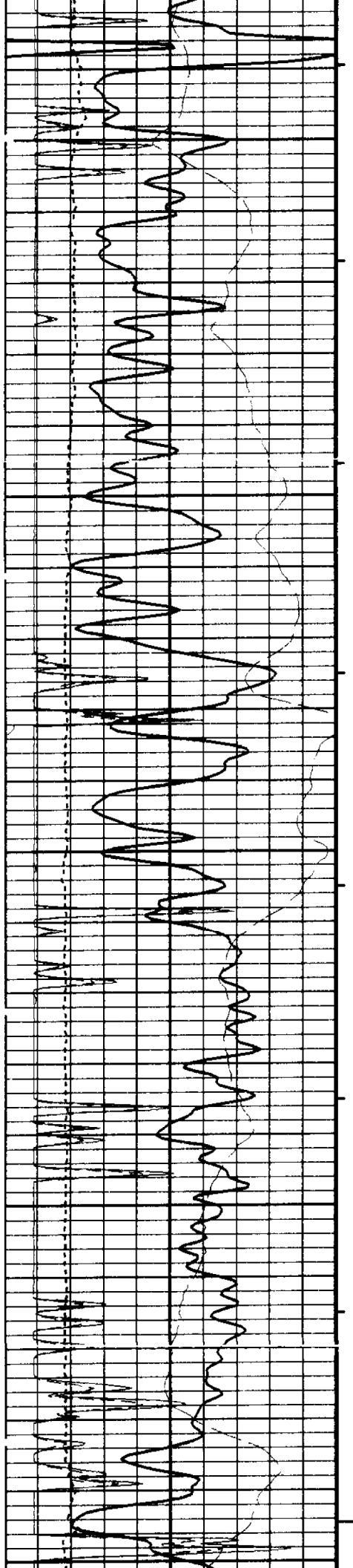


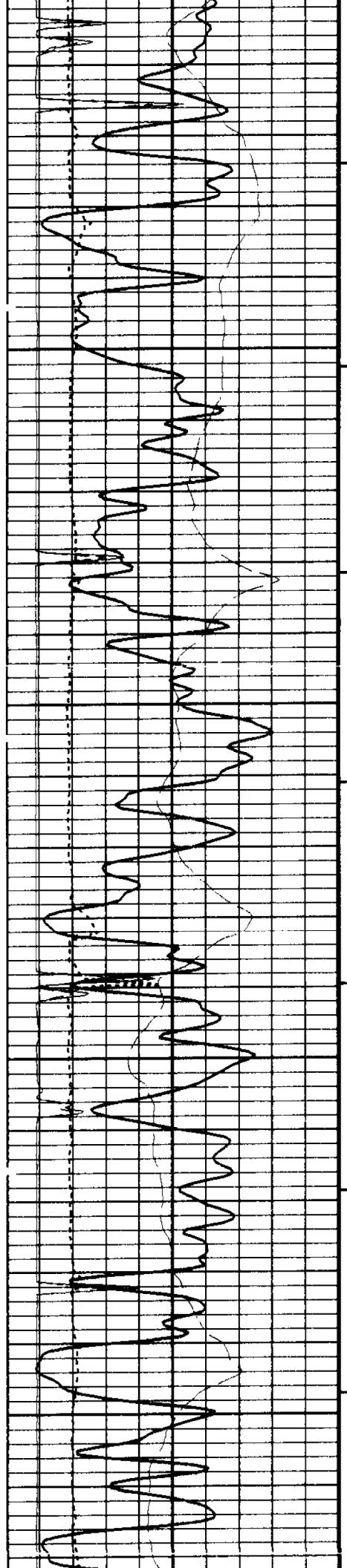






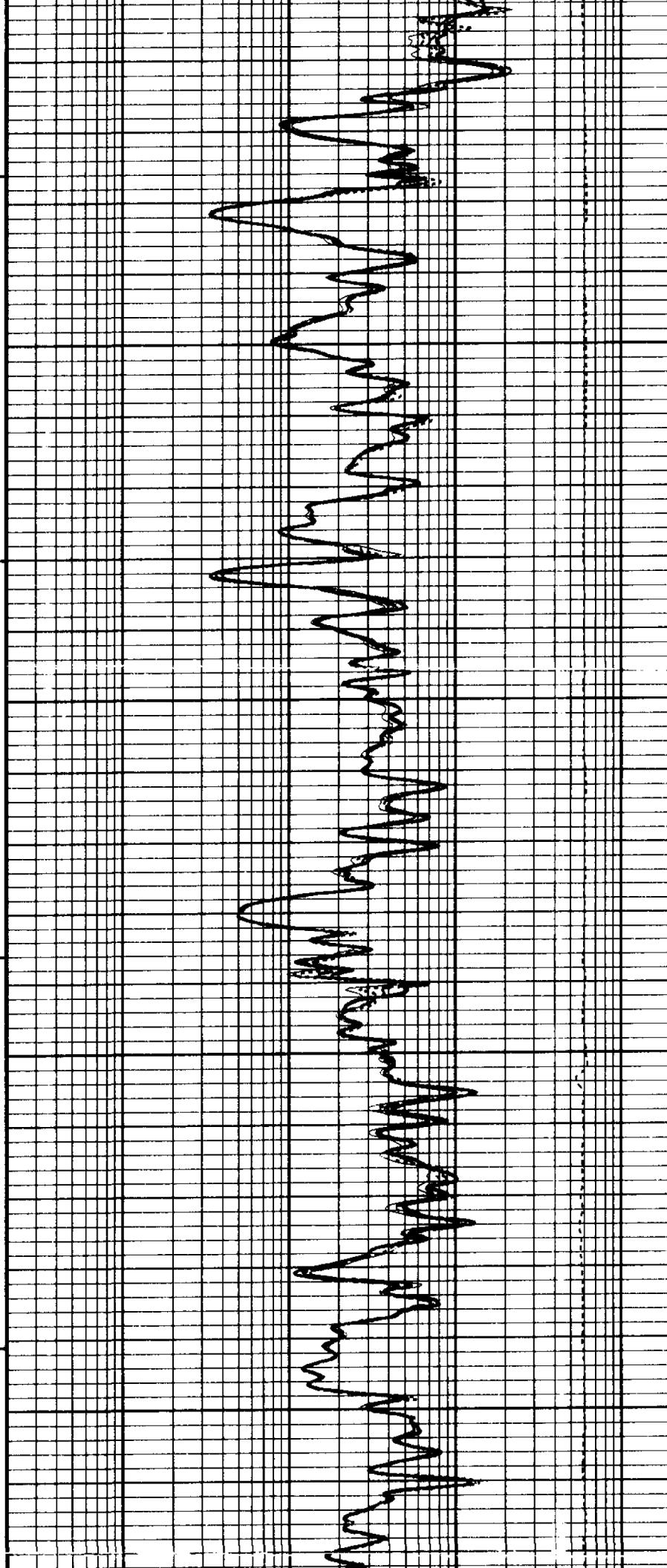


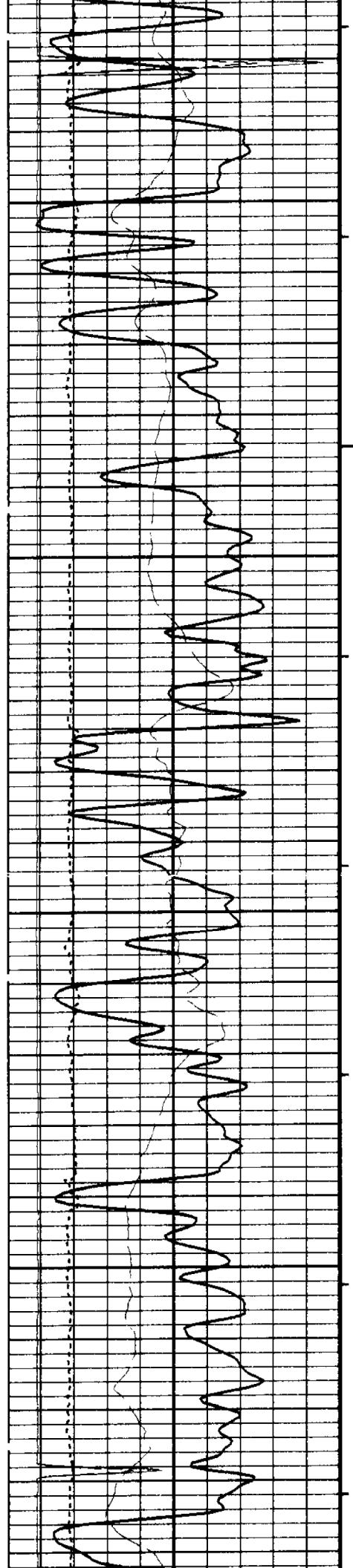




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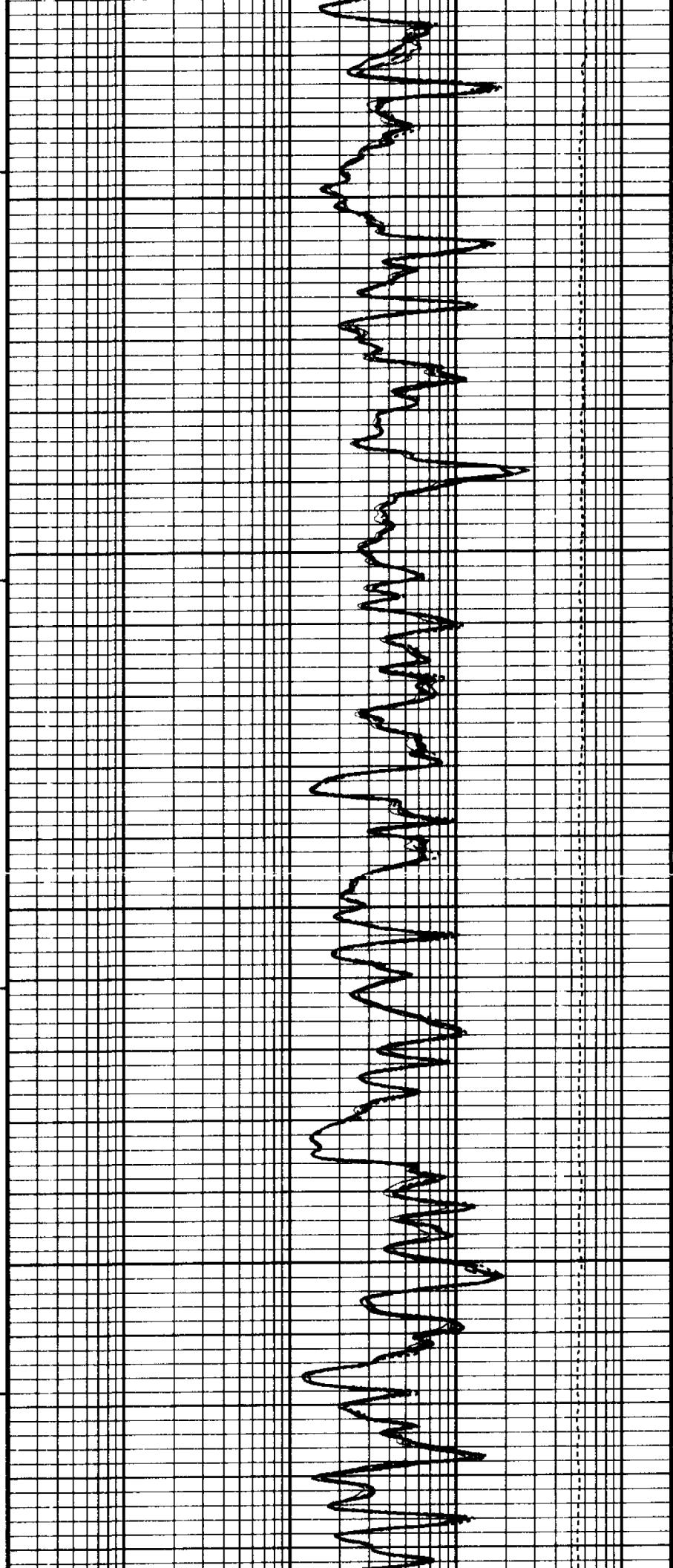
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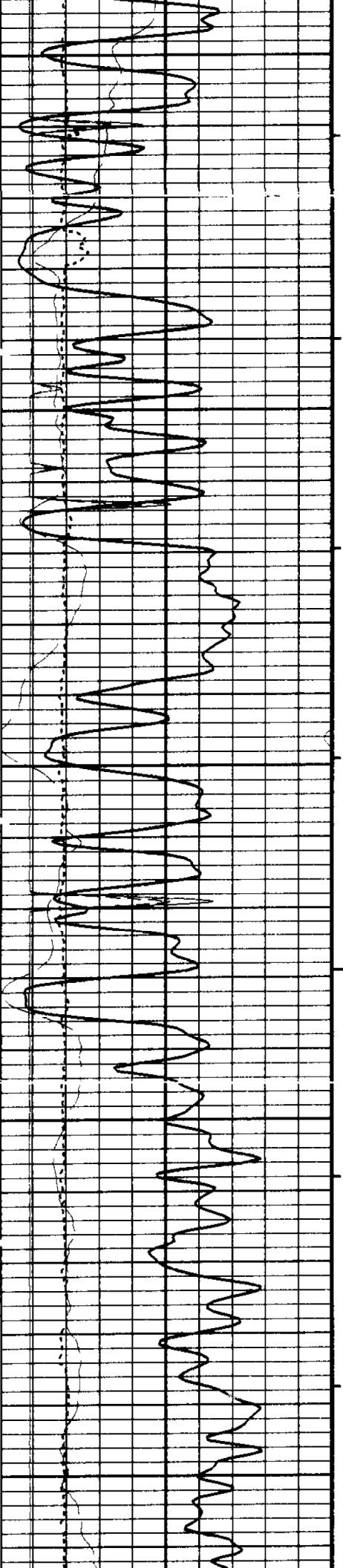




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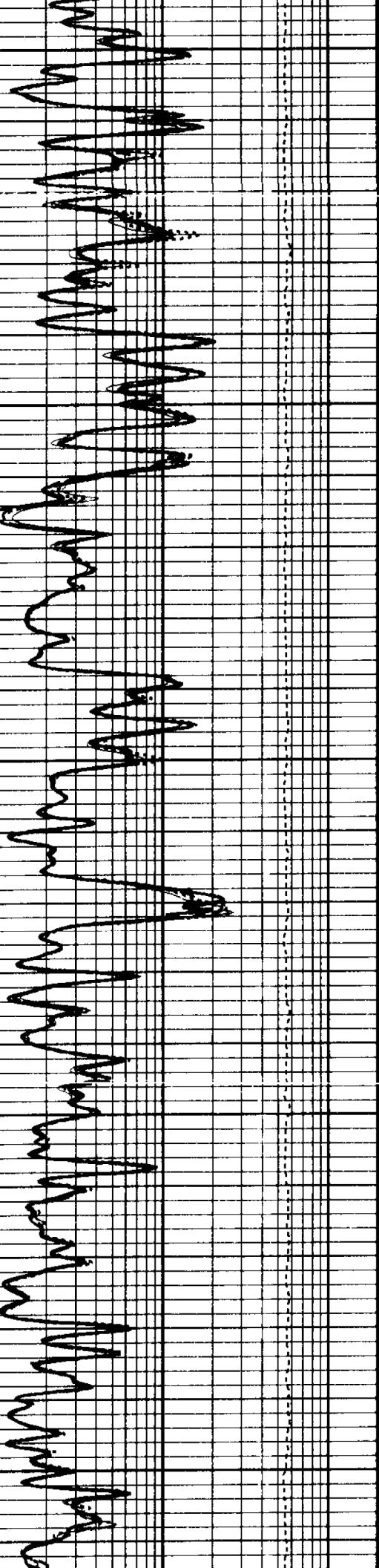
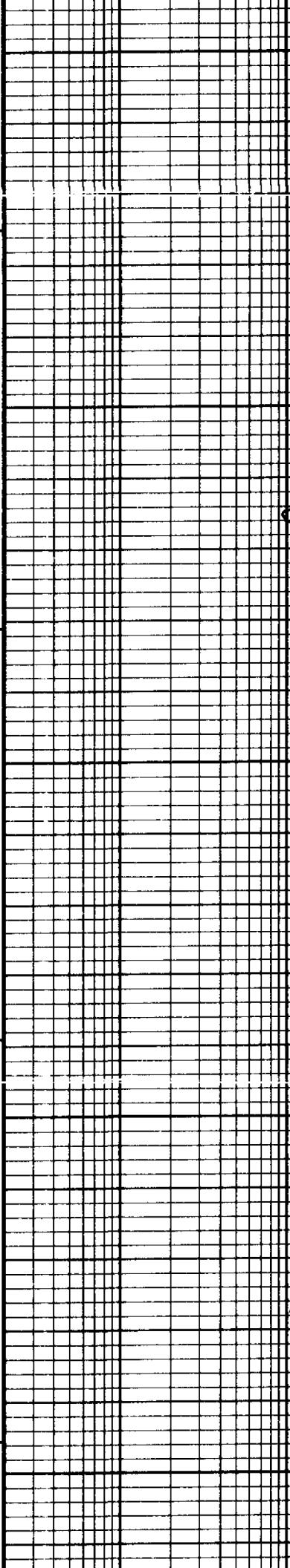


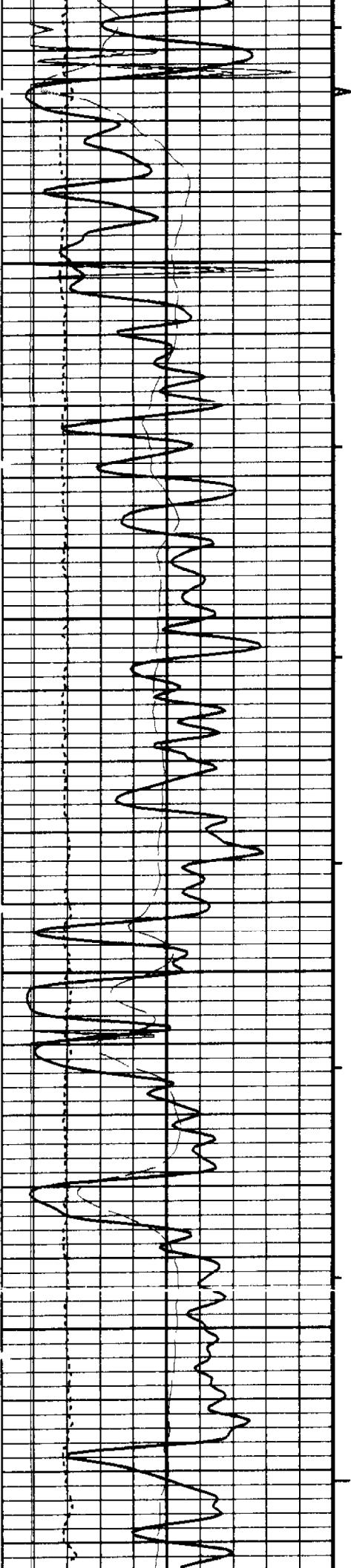


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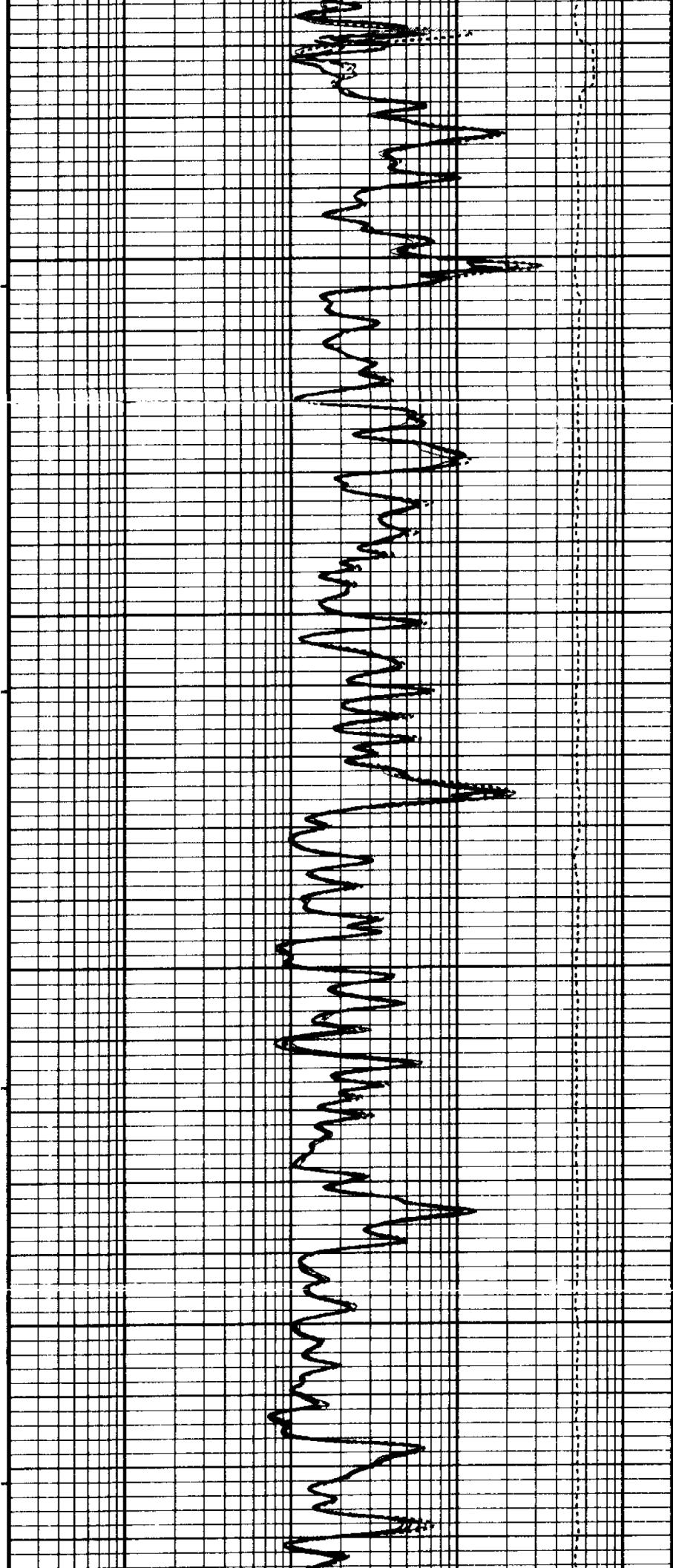
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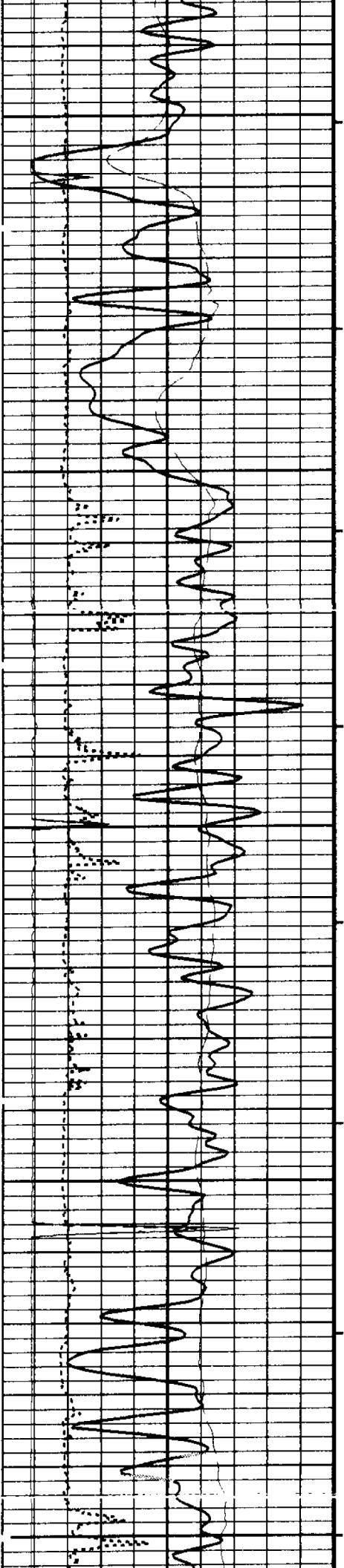




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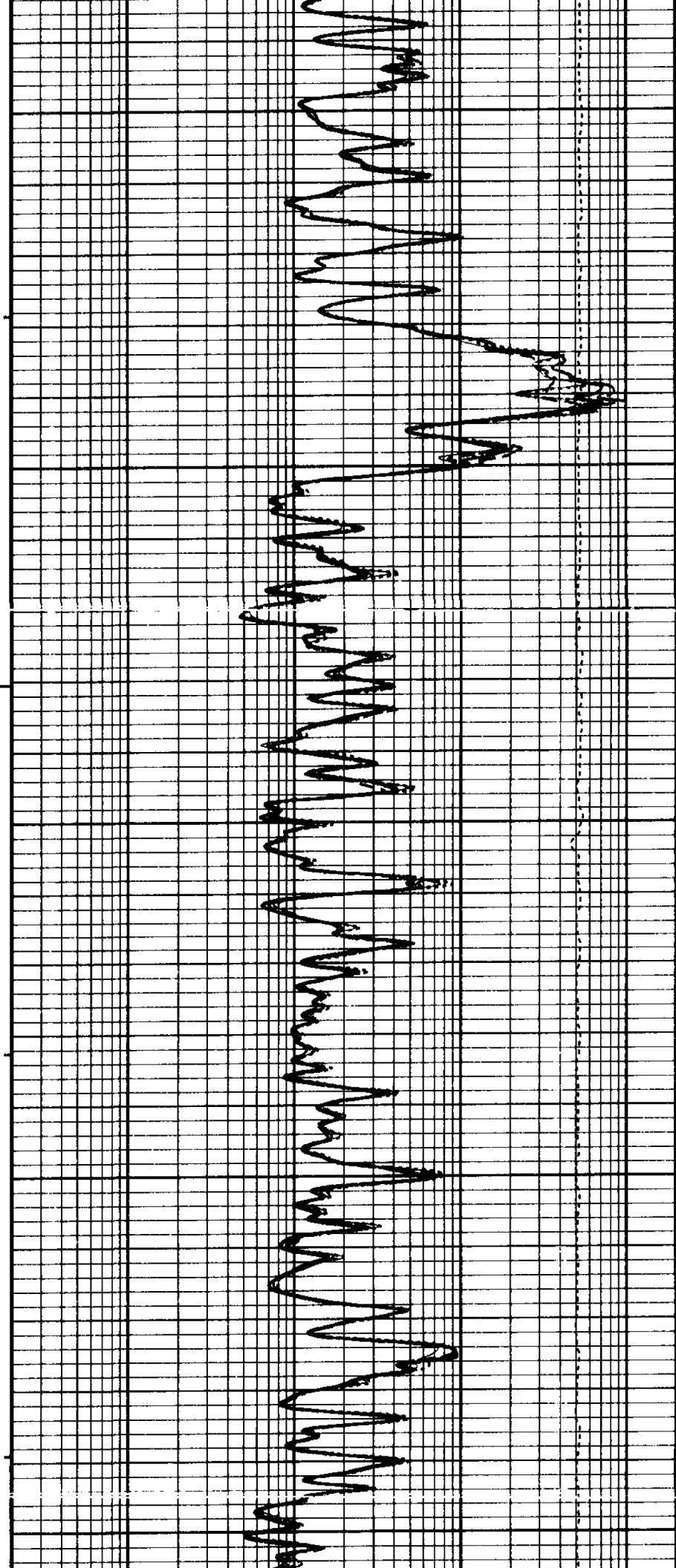
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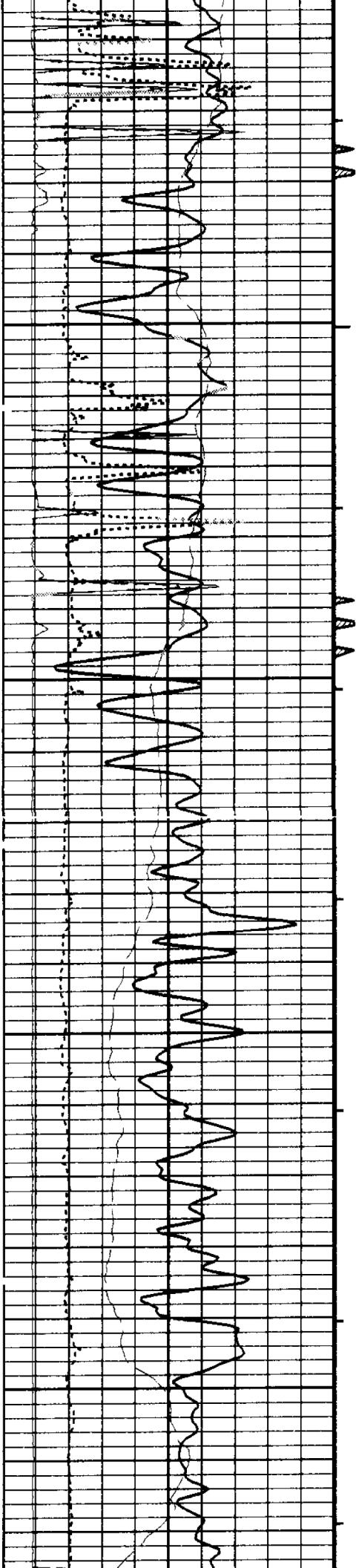




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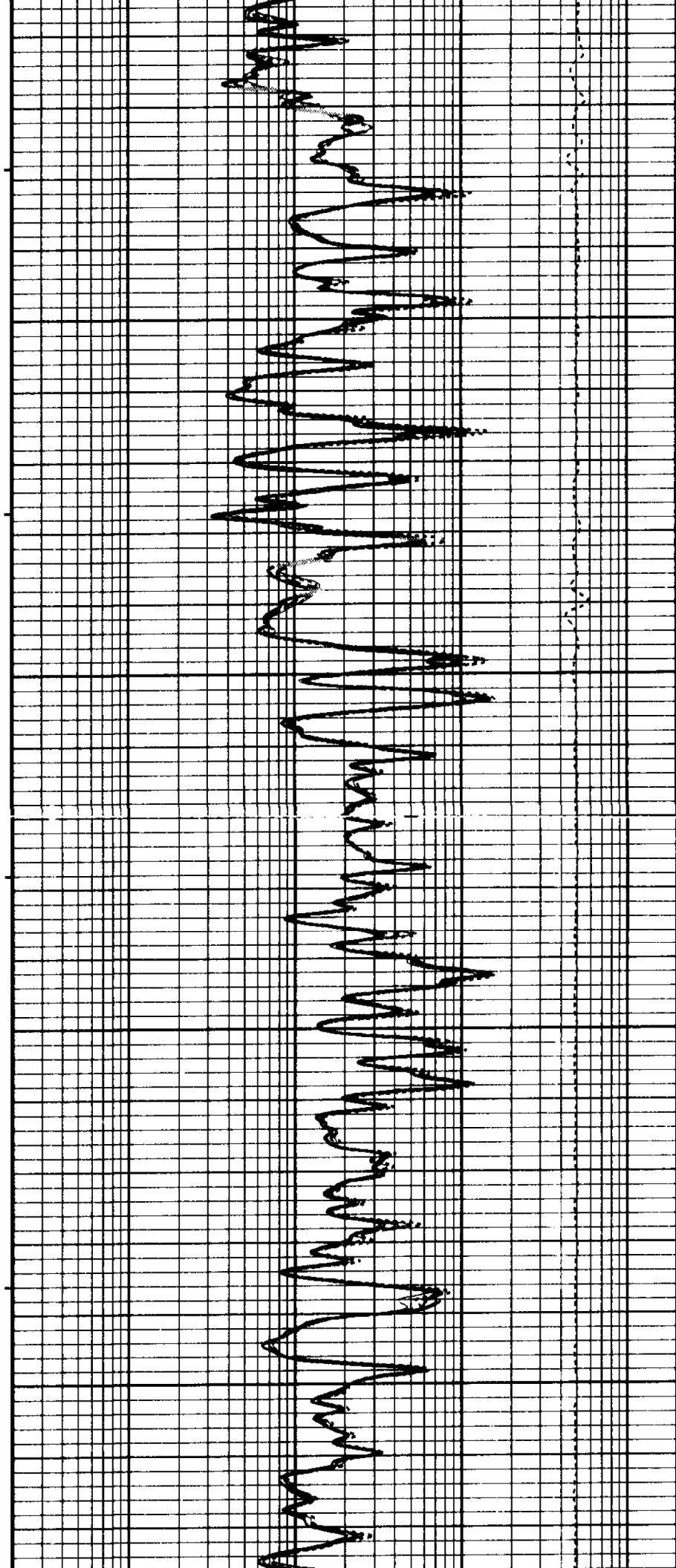
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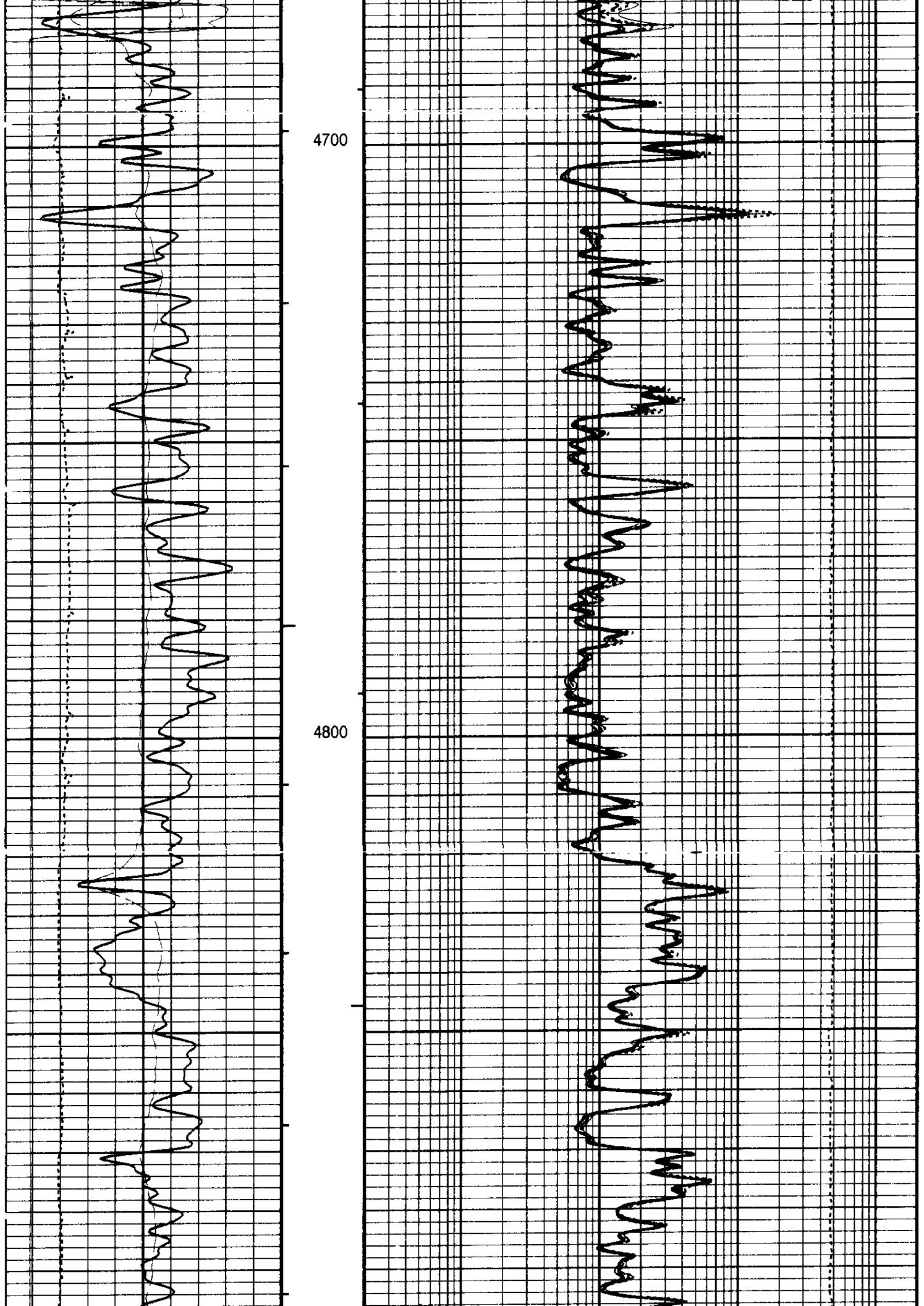


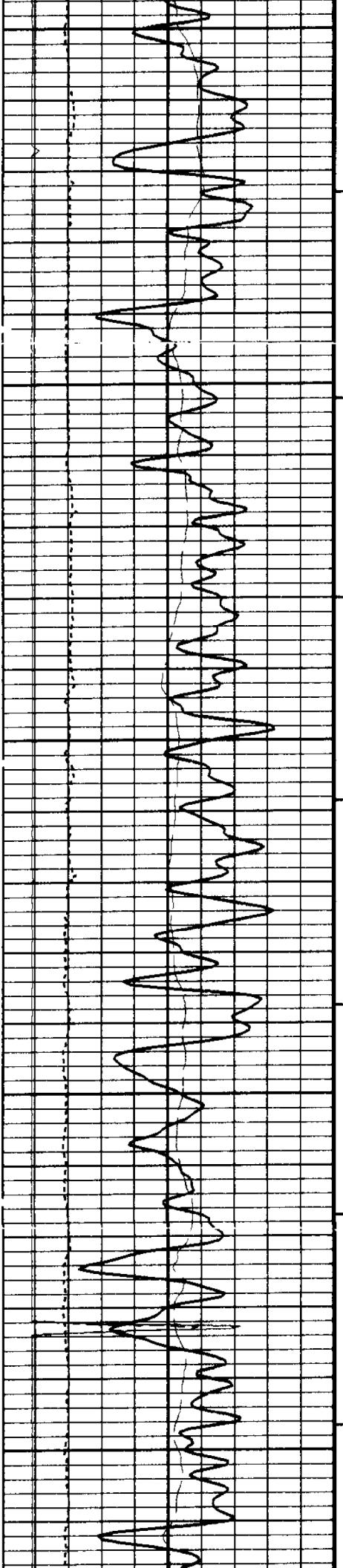
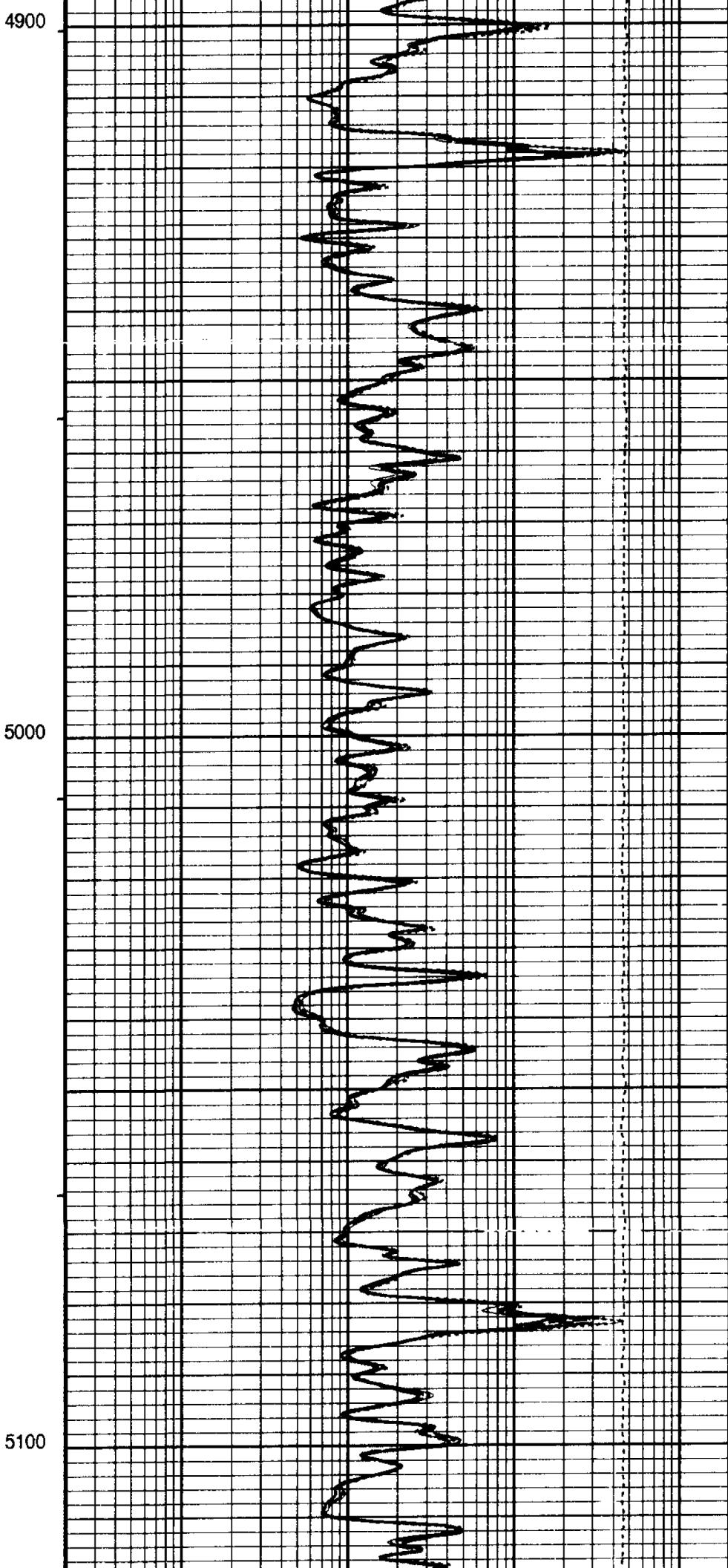


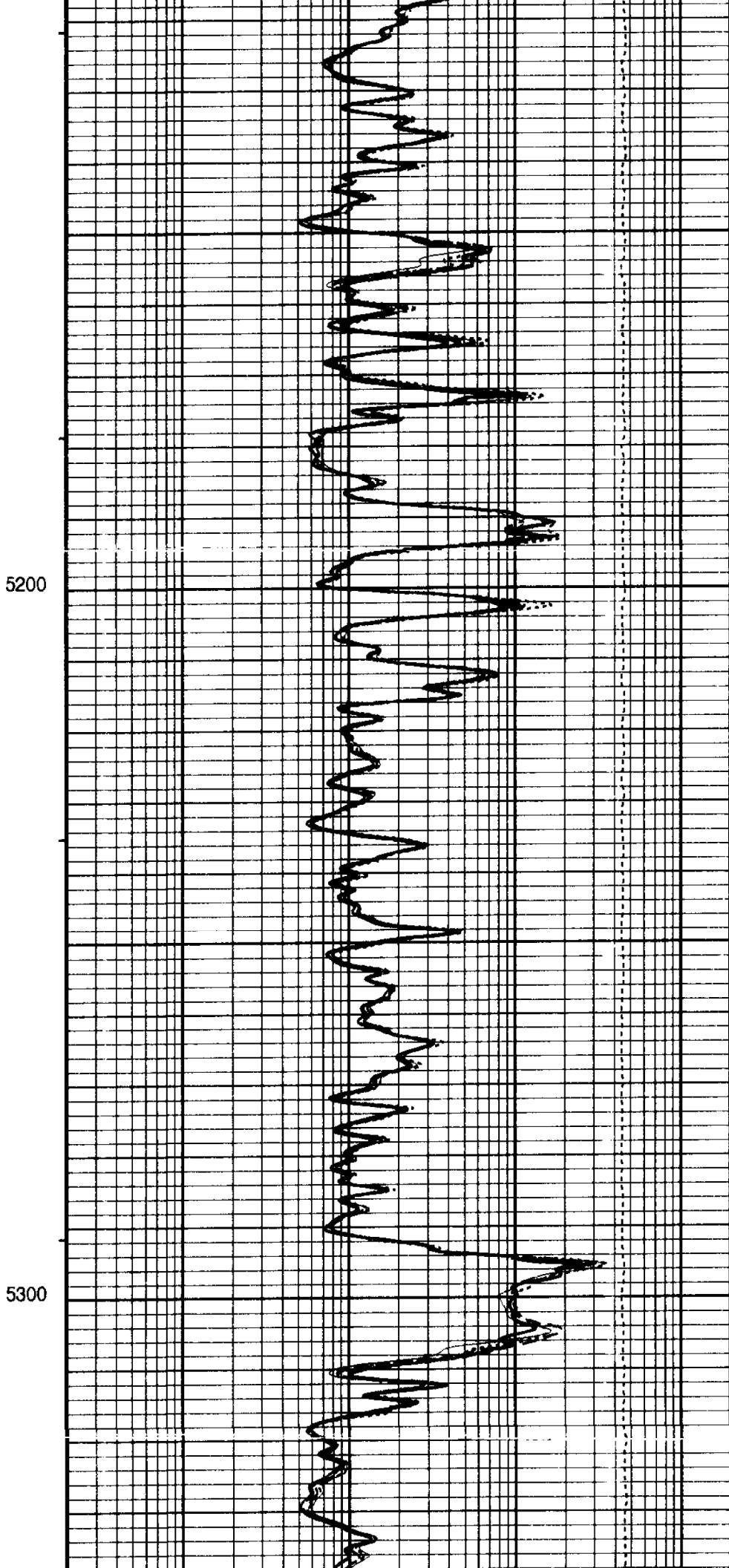
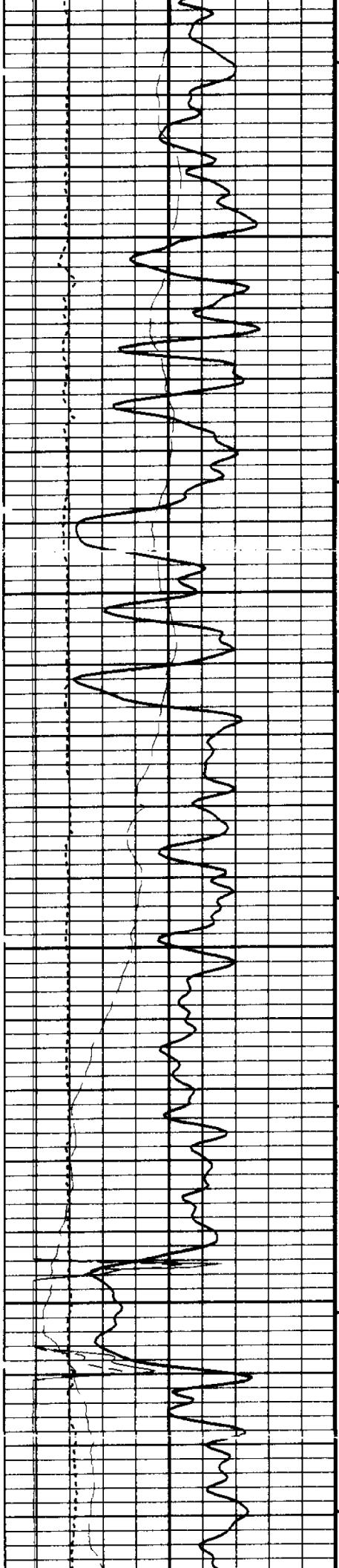
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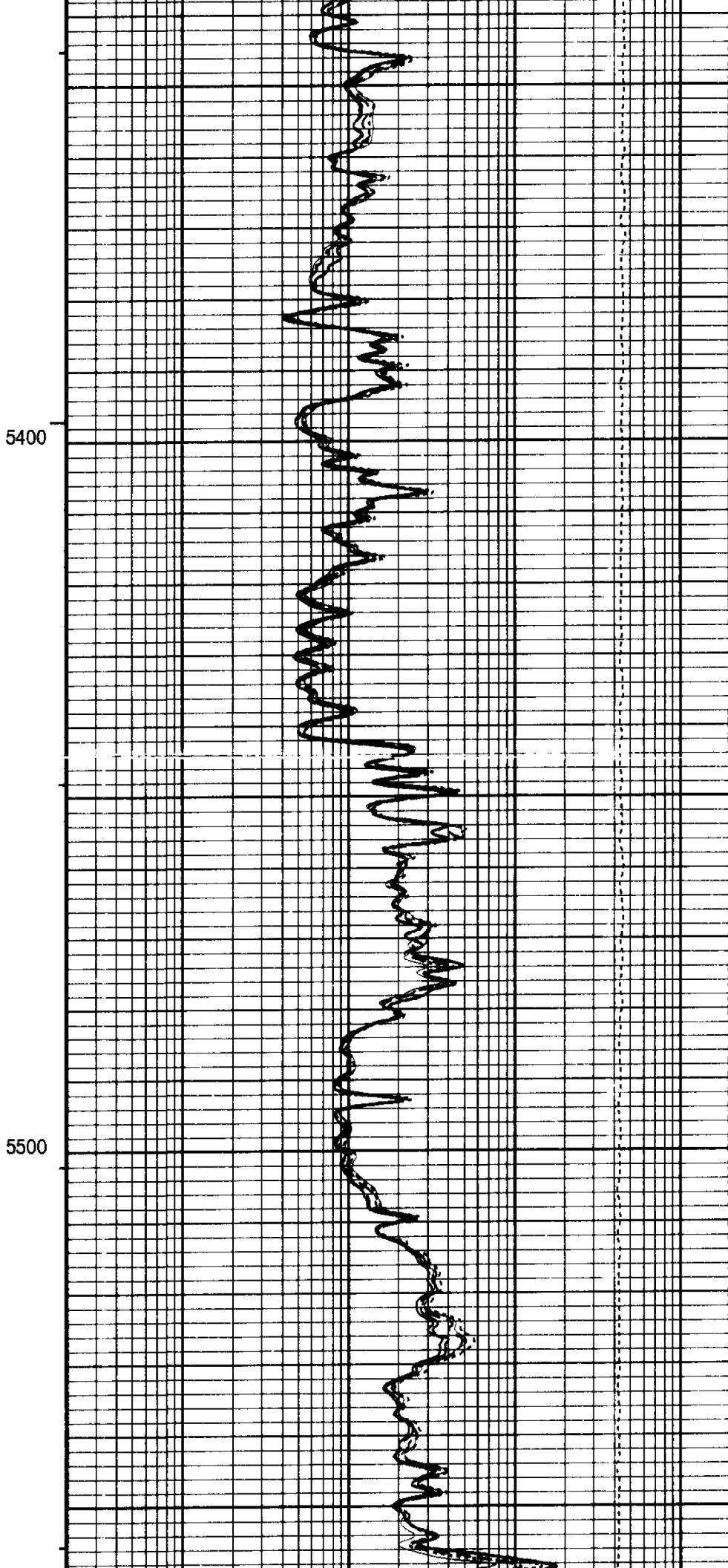
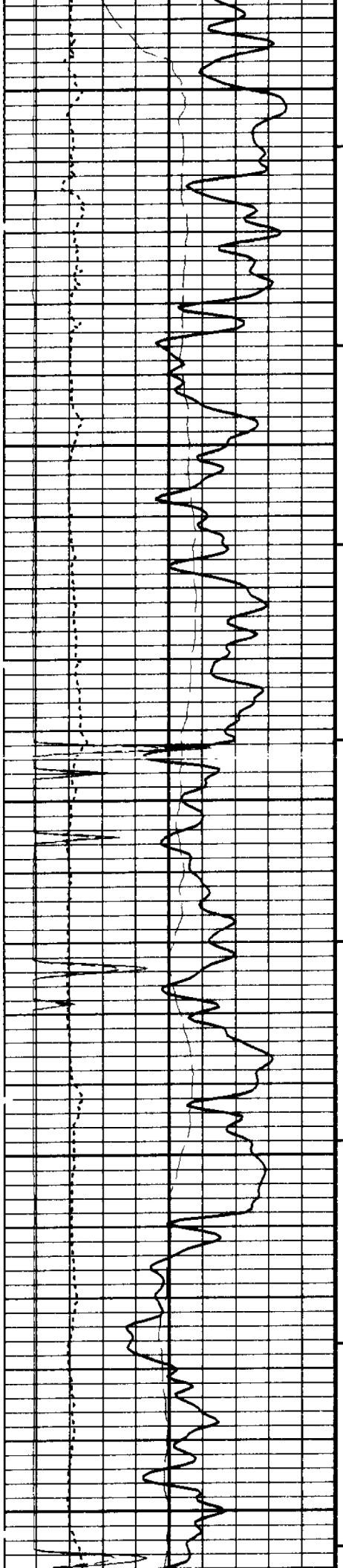
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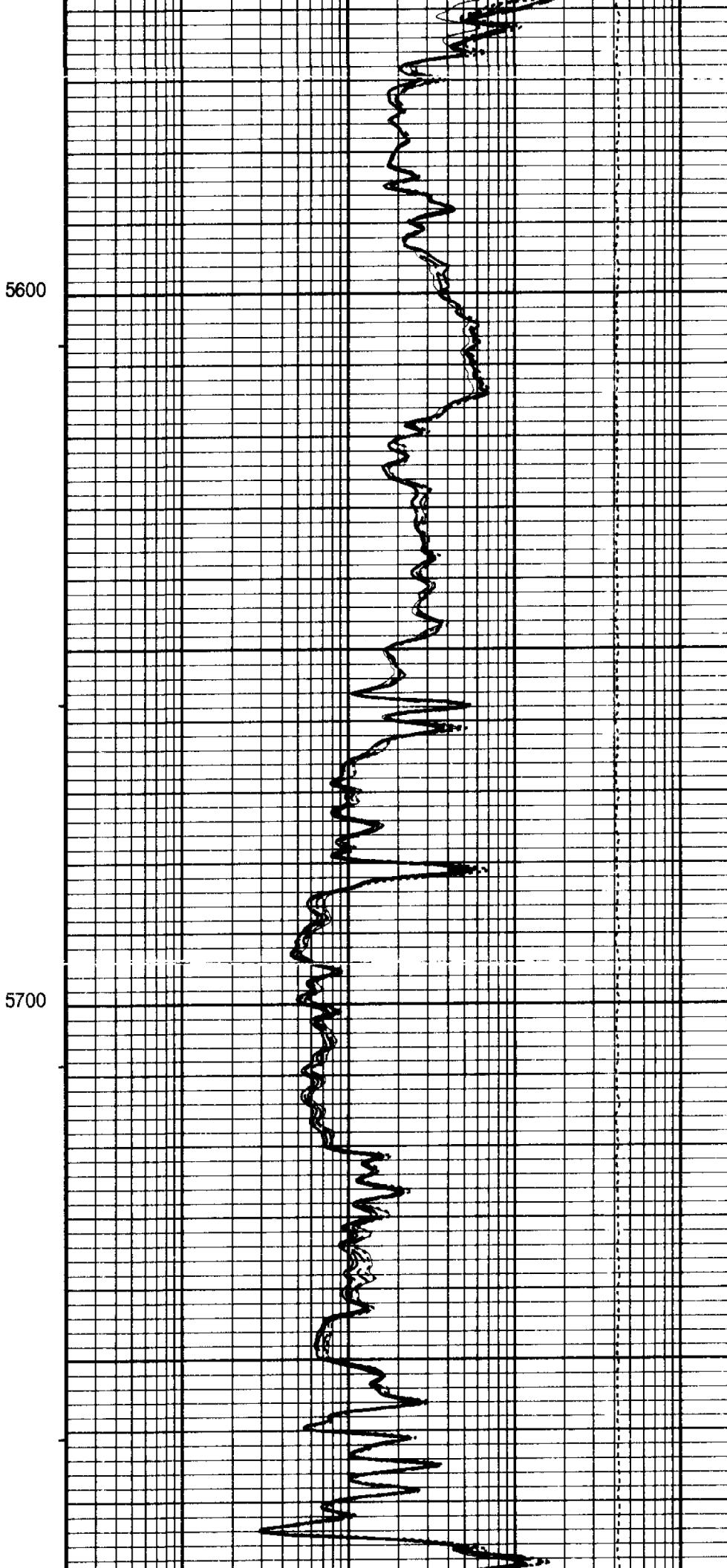
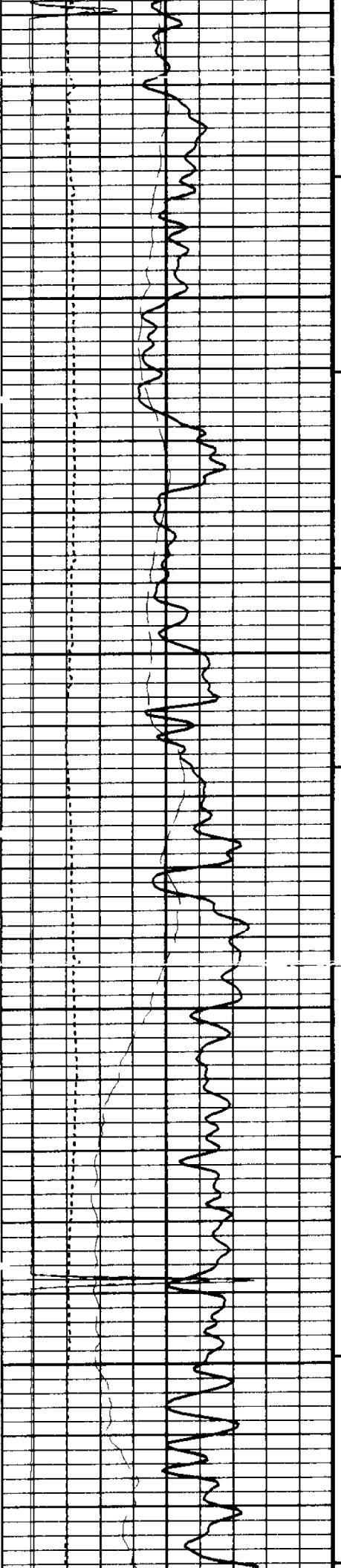


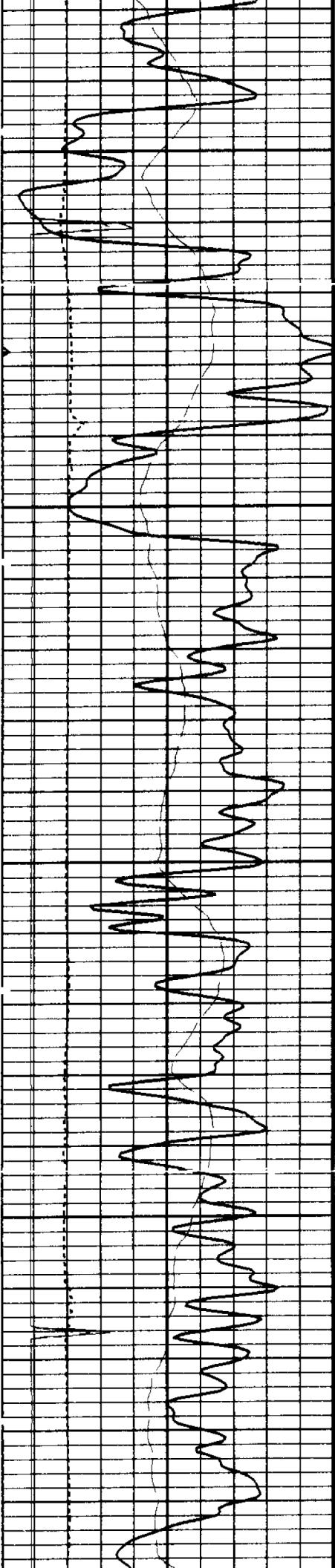




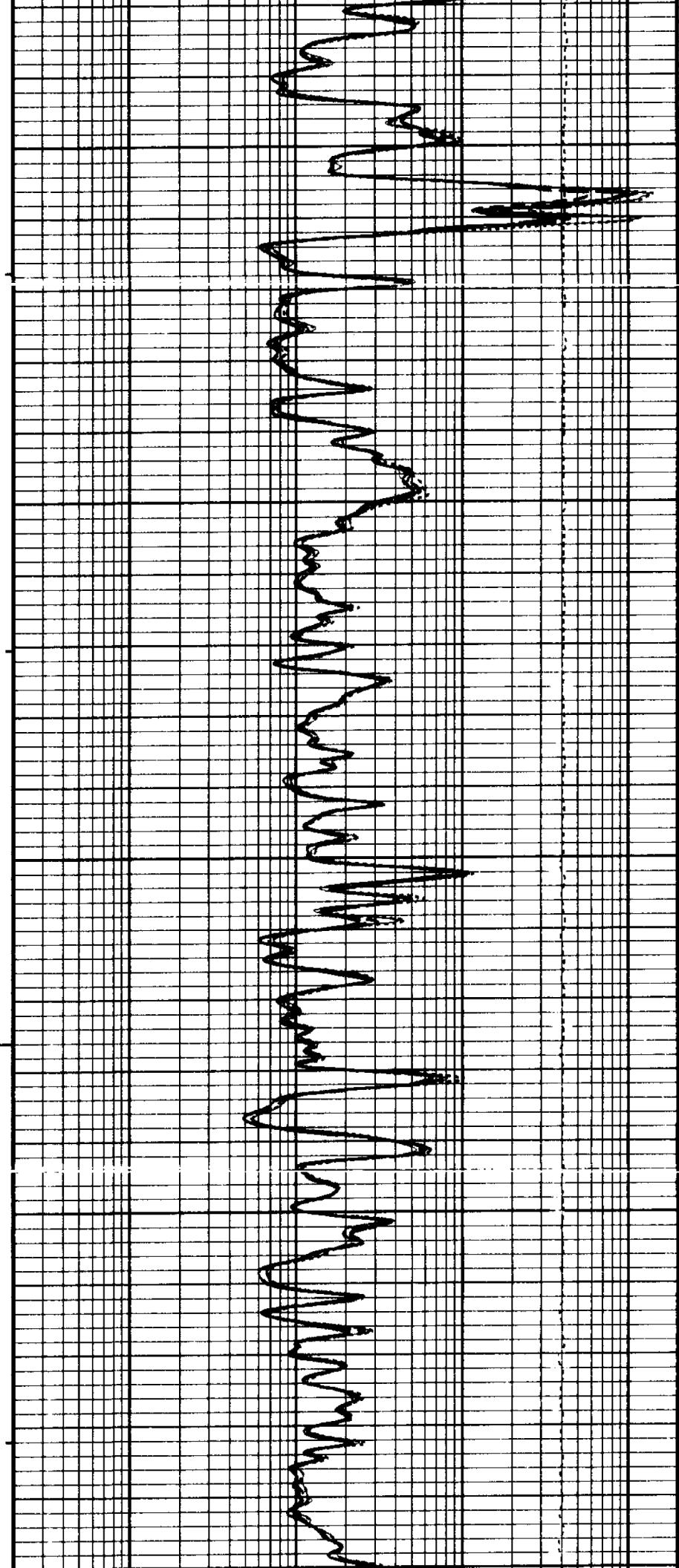


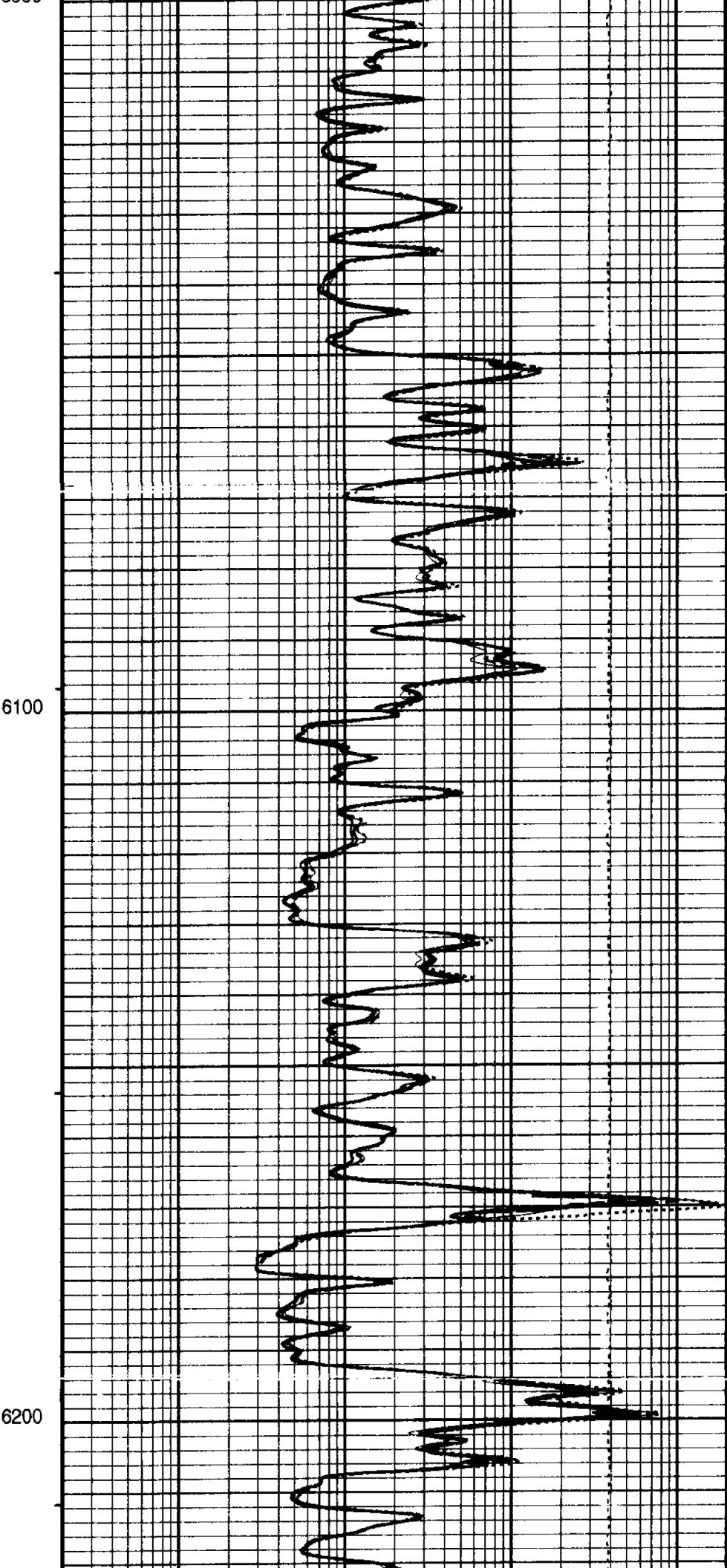
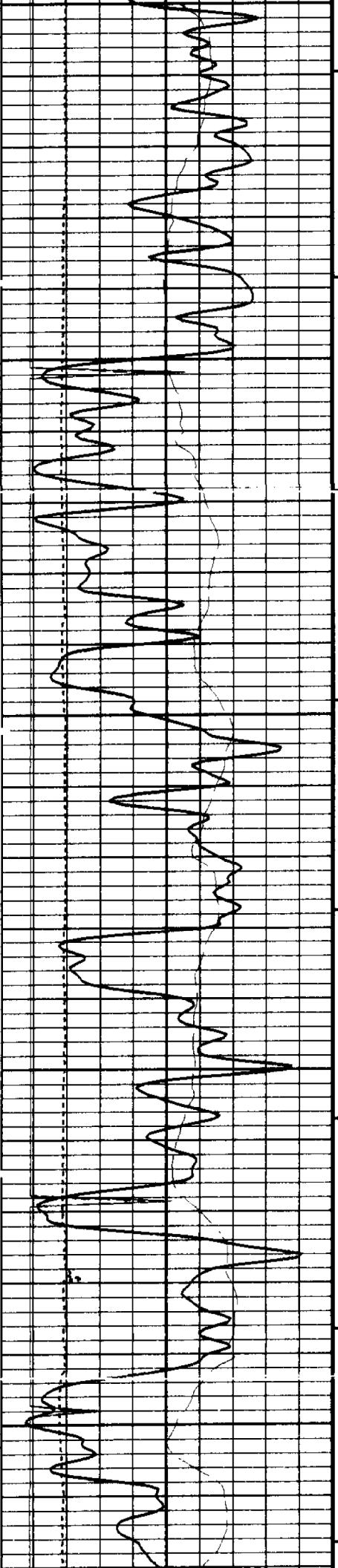


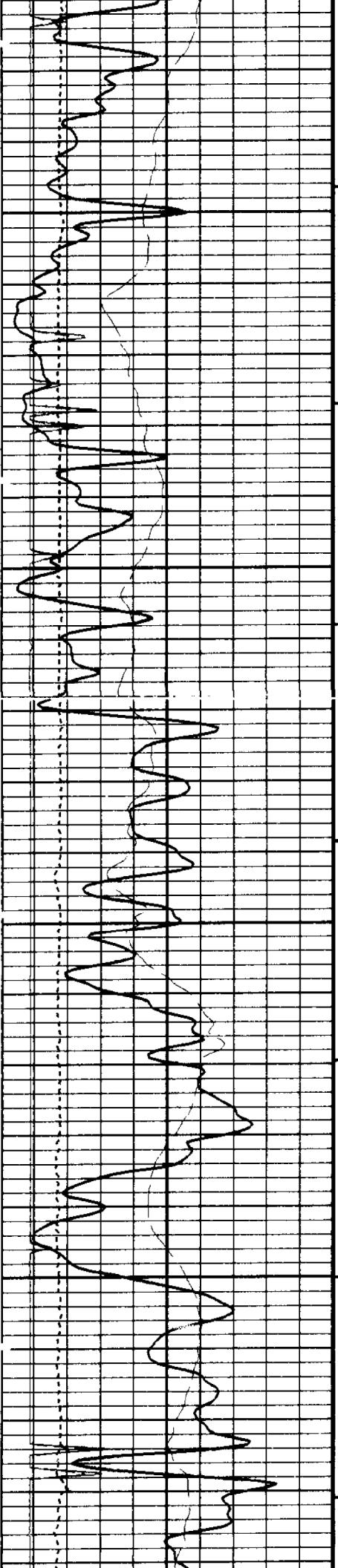




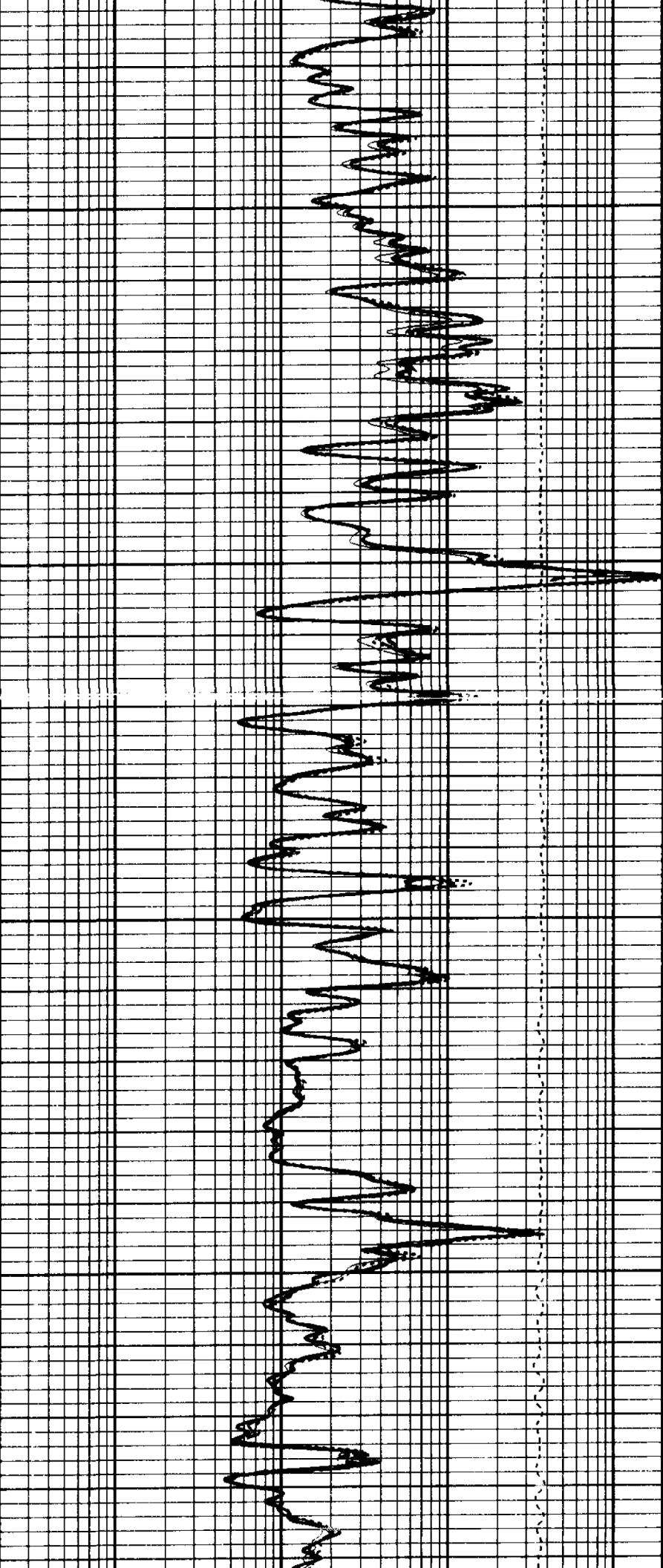
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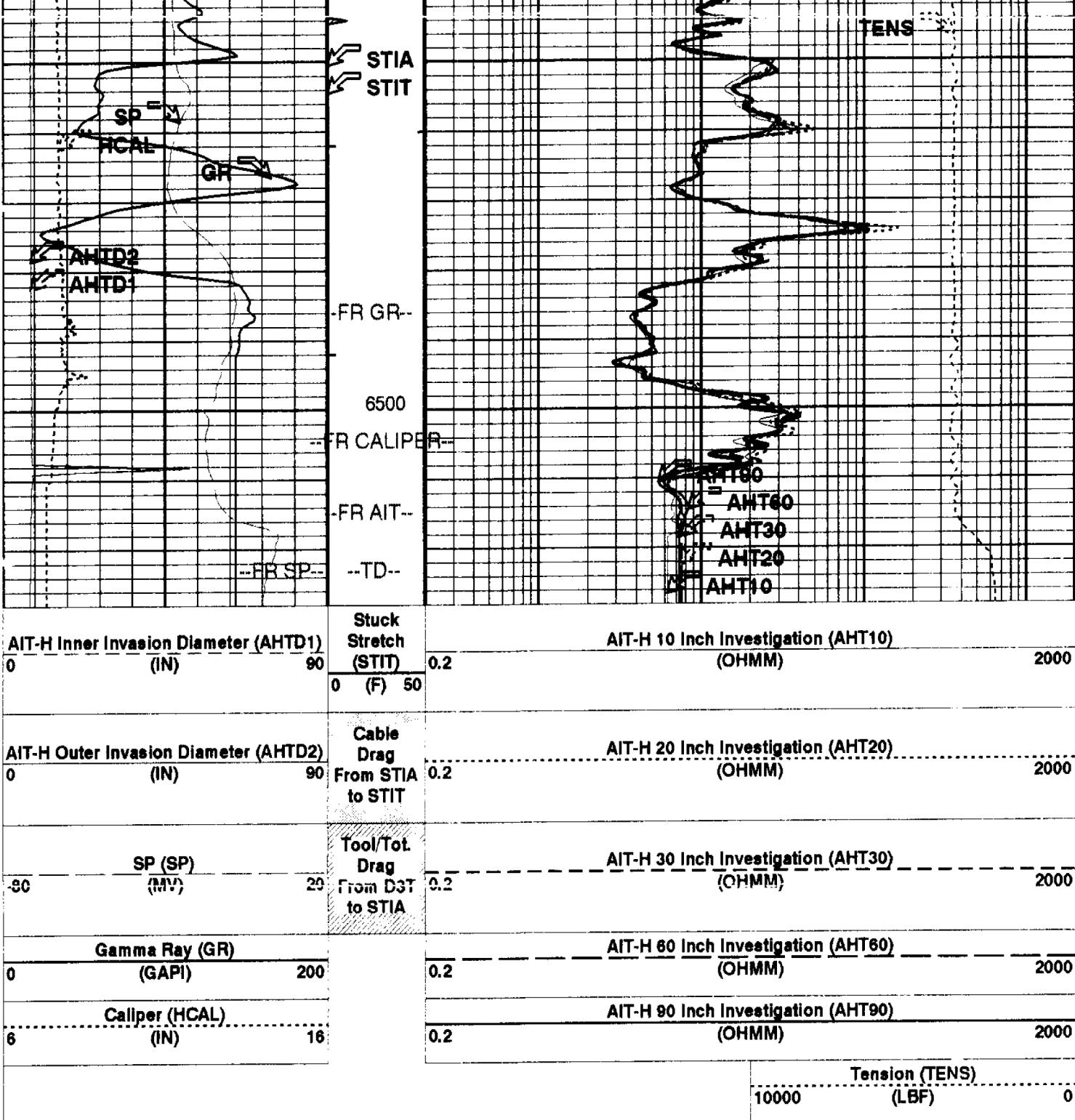




6300



6400



### MAIN PASS

### PIP SUMMARY

- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
  - Integrated Cement Volume Minor Pip Every 10 F3
  - Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

AIT-H Answer Product Processing Summary. Data taken with tool # 100 (AHTNO)

...Acquired data from HILT/HAIT

\*\*\*\*\* Hole Correction \*\*\*\*\*

Effective Tool Standoff computed. Borehole diameter and mud res. taken as input (see GCSE and GRSE parameters)

Tool is run in ECENTERED mode with a tool stand-off of 1.13 IN. Bit Size is 7.88 IN.

\*\*\*\*\* Input Selections to AIT Answer Product processing \*\*\*\*\*

Caliper (GCSE): HCAL Mud Resistivity (GRSE): AHMF Temperature (GTSE): LINEAR\_ESTIMATE Porosity (FPHI): DPHZ

\*\*\*\*\* Other parameters used by AIT-H Answer Product processing \*\*\*\*\*

Surface Hole Temperature (SHT)

49.000 DEGF

Bottom Temperature (BHT)

136.000 DEGF

Total Depth (TD)	6524.000 FT		
Form Factor Exponent (FEXP)	2.000	Form Factor Numerator (FNUM)	1.000
Mud Filtrate Sample Resistivity (RMFS)	2.370 OHMM	Mud Filtrate Sample Temperature (MFST)	49.000 DEGF
Resistivity Connate Water (RW)	1.000 OHMM		

\*\*\*\*\* AIT-H Answer Product processing control parameters \*\*\*\*\*

(AHAPL): 4\_BholeCorr\_BasicLogs\_RadialProf\_RadialPar

(AHBHM): 2\_ComputeStandoff (AHBLM): 1\_Two

(AHRPM): 1\_Two

## Parameters

DLIS Name	Description	Value
AHBHM	AIT-H Bhole Correction Mode	2_ComputeStandoff
AHCDE	AIT-H Casing Detection Enable	Yes
AHCEN	AIT-H Tool Centering Flag (in Borehole)	Eccentered
AHCSED	AIT-H Casing Shoe Estimated Depth	-50000
AHMRF	AIT-H Mud Resistivity Factor	FT
AHSTA	AIT-H Tool Standoff	1
BHT	Bottom Hole Temperature (used in calculations)	1.125
BS	Bit Size	136
DFD	Drilling Fluid Density	IN
DORL	Depth Offset Repeat Analysis	7.875
FEXP	Form Factor Exponent	IN
FNUM	Form Factor Numerator	8.60
GCSE	Generalized Caliper Selection	LB/G
GDEV	Average Angular Deviation of Borehole from Normal	0.0
GGRD	Geothermal Gradient	FT
GRSE	Generalized Mud Resistivity Selection	DEG
GTSE	Generalized Temperature Selection	DF/F
HMPCO	HILT RTSC Measure points correction	HCAL
HSCM	HILT Speed Correction Mode	0
HSTI	STI Uses HILT Acceleration	DEG
MST	Mud Sample Temperature	49.00
SHT	Surface Hole Temperature	49
SPNV	SP Next Value	DEGF
STKT	STI Stuck Threshold	0
TD	Total Depth	MV
		2.5
		FT
		6524
		FT

Format: AITH\_BasicLogTwo Vertical Scale: 5' per 100'

Graphics File Created: 31-OCT-1996 18:30

## OP System Version: 7C0-427 DBM

HILTB-CTS	RPCVX-680	ALLRES	RPCVX-680
HOLEV	RPCVX-680	PERT	RPCVX-680

## Speed Corrected - Depth Matched LOG

### Output DLIS Files

DEFAULT	HILTC .004	FN:3	FIELD	31-OCT-1996 18:30
REDUCED	HILTC .004	FN:4	CUST	31 OCT 1996 18:30

### Input DLIS Files

DEFAULT	HILTC .003	FN:2	FIELD	31-OCT-1996 18:02	6534.0 FT	6098.5 FT
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### Output DLIS Files

DEFAULT	HILTC .004	FN:3	FIELD	31-OCT-1996 18:30
REDUCED	HILTC .004	FN:4	CUST	31-OCT-1996 18:30

## Integrated Hole/Cement Volume Summary

Hole Volume = 141.83 F3

Cement Volume = 70.64 F3 (assuming 5.50 IN casing O.D.)

Computed from 6524.0 FT to 6093.0 FT using data channel(s) HCAL

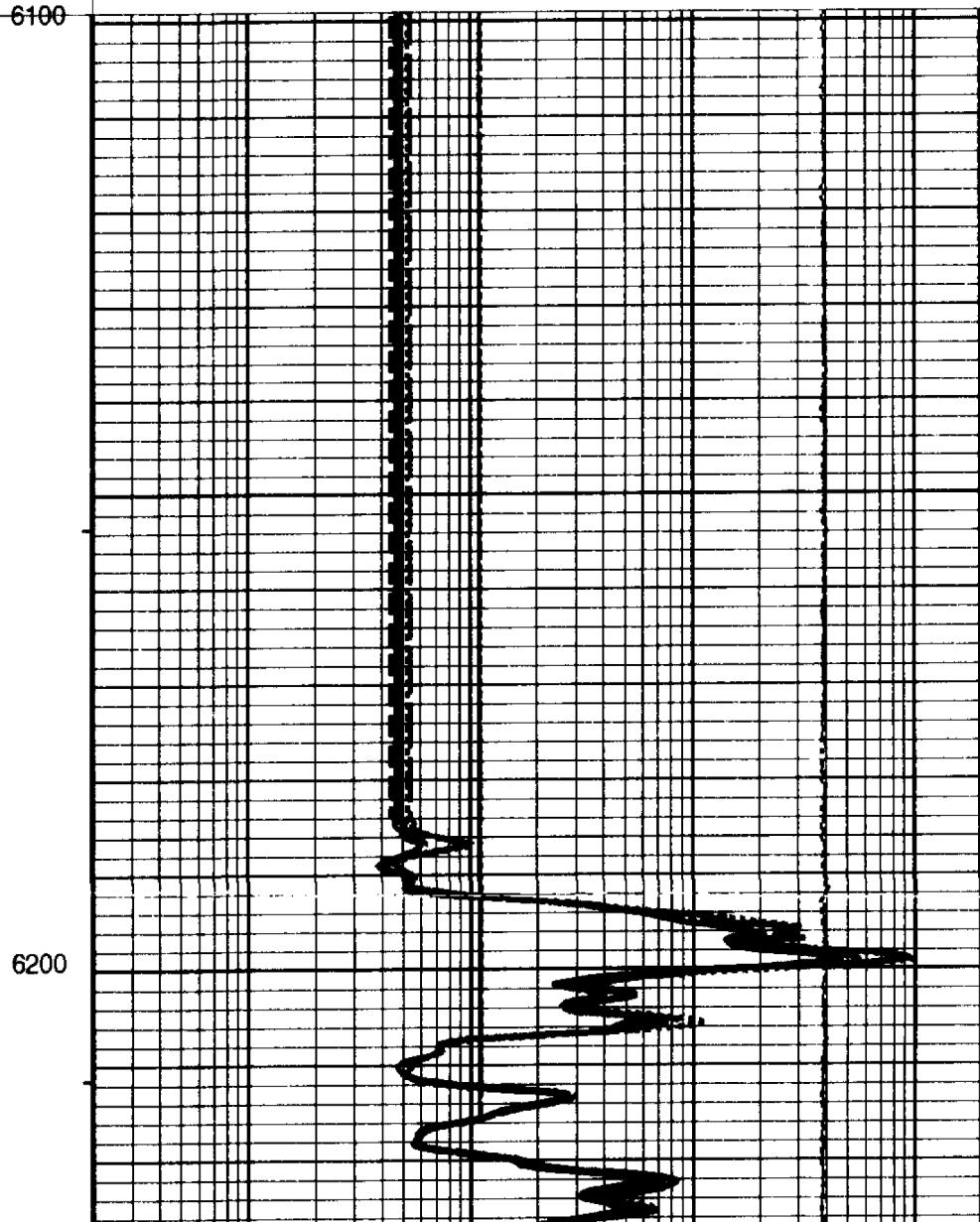
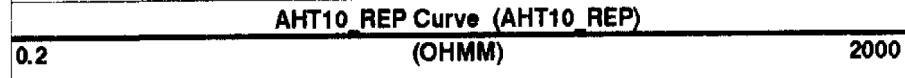
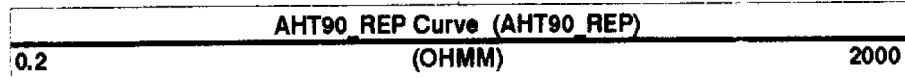
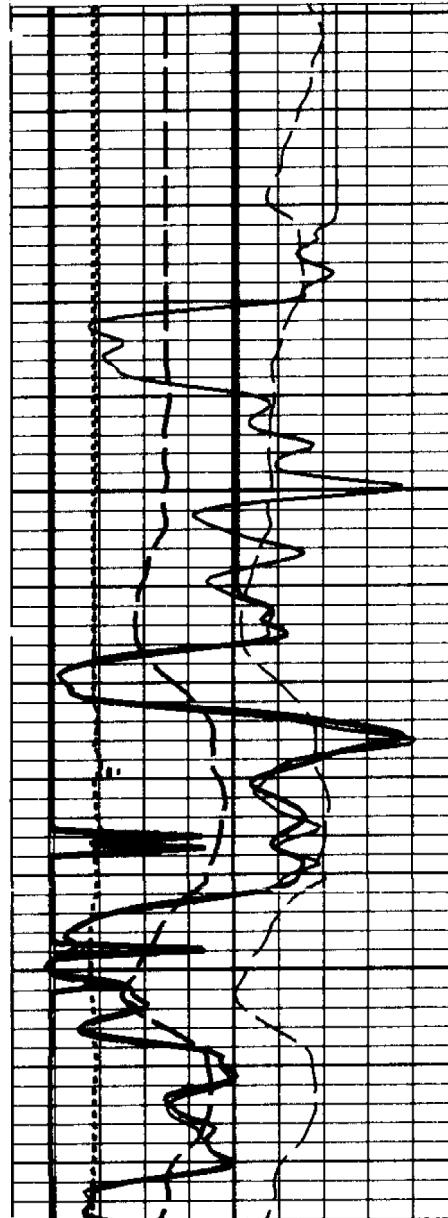
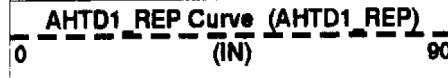
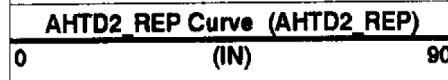
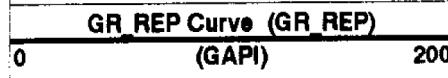
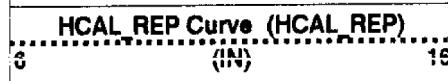
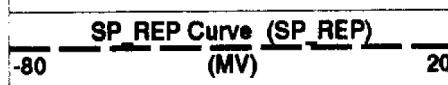
REPEAT ANALYSIS

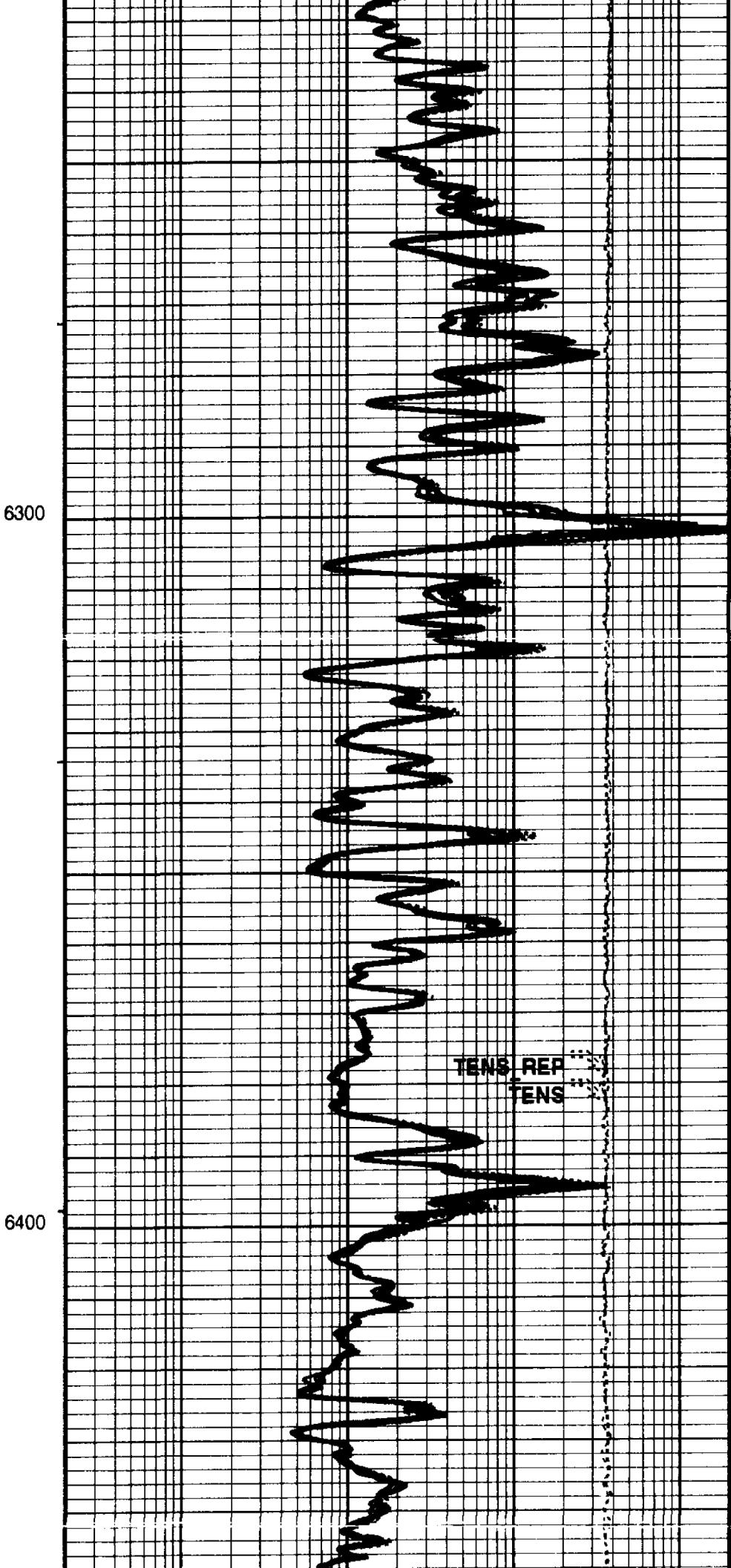
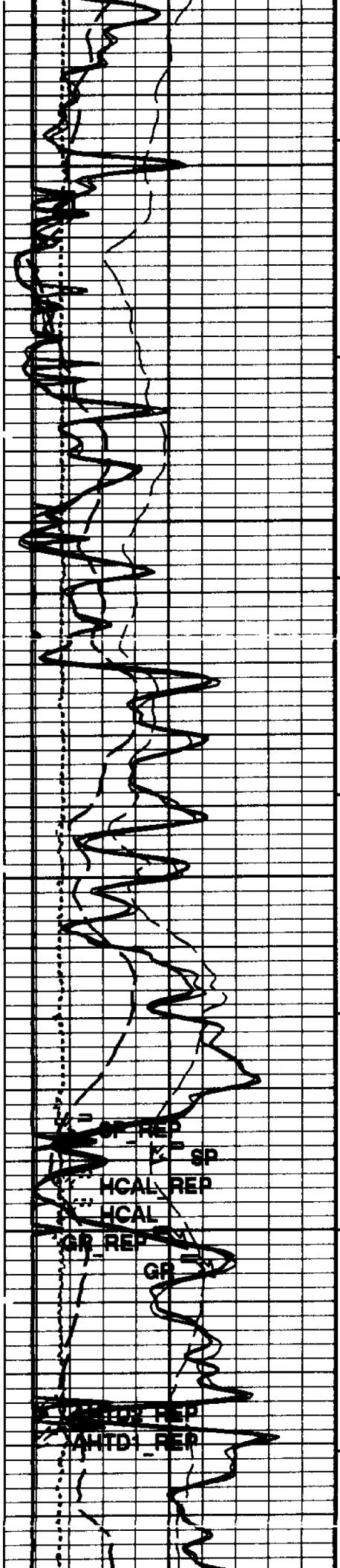
HILTB-CTS  
HOLEVRPCVX-680  
RPCVX-680ALLRES  
PERTRPCVX-680  
RPCVX-680

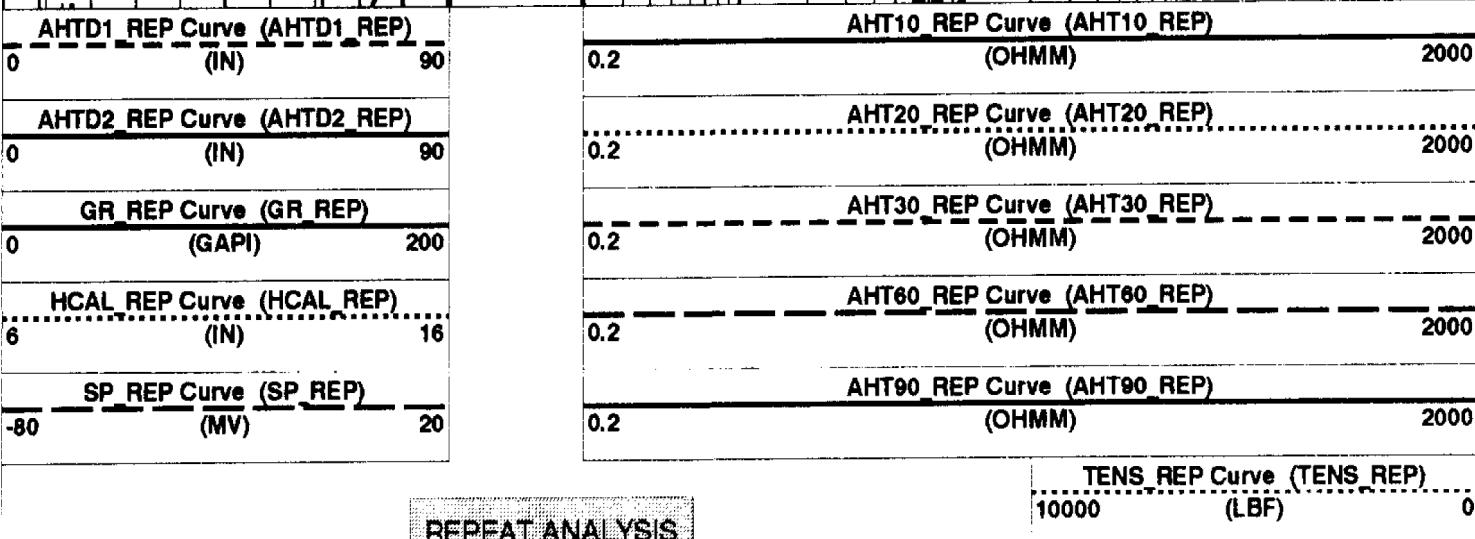
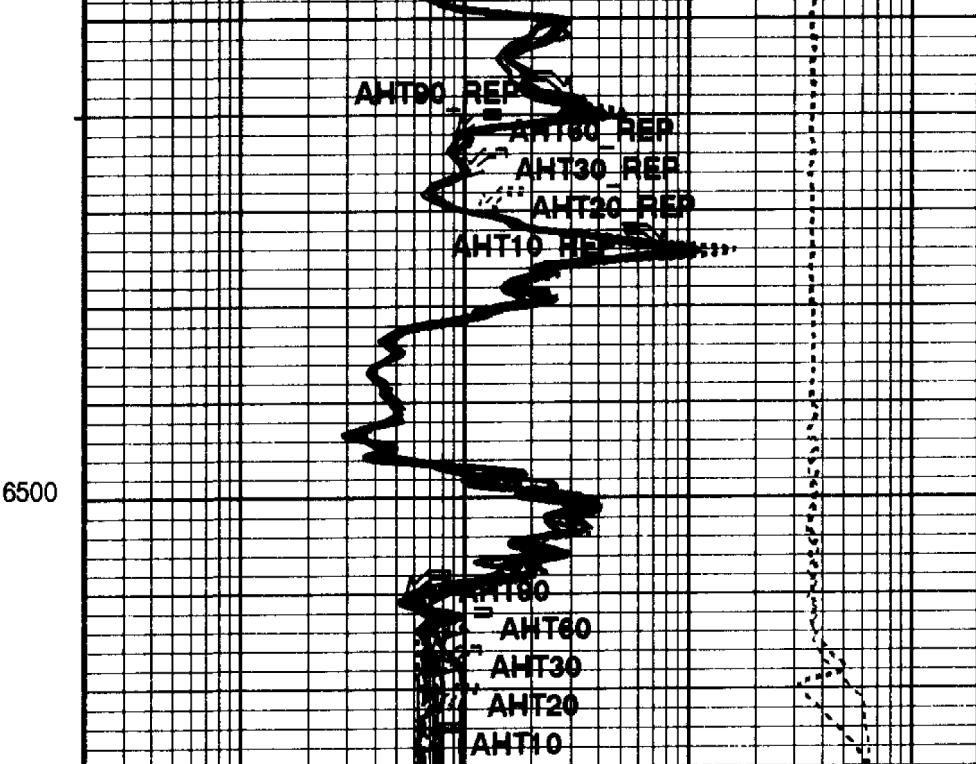
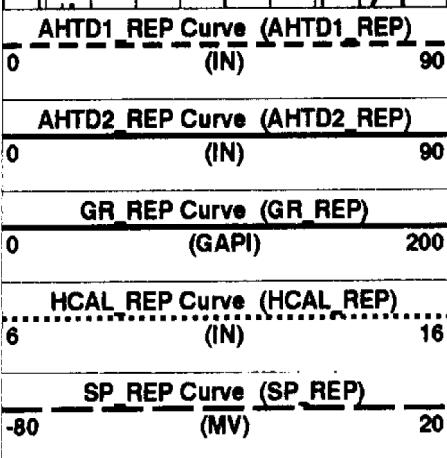
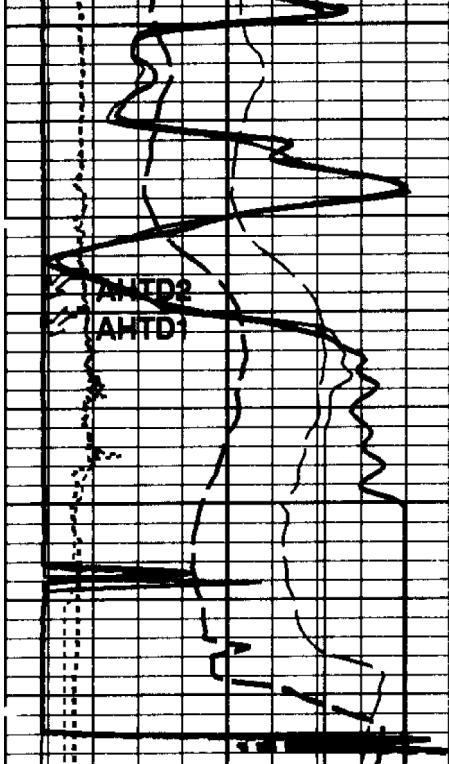
## PIP SUMMARY

- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
  - Integrated Cement Volume Minor Pip Every 10 F3
  - Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S







### REPEAT ANALYSIS

#### PIP SUMMARY

- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
  - Integrated Cement Volume Minor Pip Every 10 F3
  - Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

AIT-H Answer Product Processing Summary. Data taken with tool # 100 (AHTNO)

...Acquired data from HILT/HAIT

\*\*\*\*\* Bhole Correction \*\*\*\*\*

Effective Tool Standoff computed.      Borehole diameter and mud res. taken as input (see GCSE and GRSE parameters)

Tool is run in ECENTERED mode with a tool stand-off of 1.13 IN. Bit Size is 7.88 IN.

\*\*\*\*\* Input Selections to AIT Answer Product processing \*\*\*\*\*

Caliper (GCSE): HCAL   Mud Resistivity (GRSE): AHMF      Temperature (GTSE): LINEAR\_ESTIMATE   Porosity (FPHI): DPHZ

\*\*\*\*\* Other parameters used by AIT-H Answer Product processing \*\*\*\*\*

Surface Hole Temperature (SHT)      49.000 DEGF      Bottom Temperature (BHT)      136.000 DEGF

Total Depth (TD)      6524.000 FT

Form Factor Exponent (FEXP)      2.000      Form Factor Numerator (FNUM)      1.000

Mud Filtrate Sample Resistivity (RMFS)      2.370 OHMM      Mud Filtrate Sample Temperature (MFST)      49.000 DEGF

Resistivity Connate Water (RW)      1.000 OHMM

\*\*\*\*\* AIT-H Answer Product processing control parameters \*\*\*\*\*

Playback Mode: NORMAL

## Parameters

DLIS Name	Description	Value
AHBHM	AIT-H Hole Correction Mode	2_ComputeStandoff
AHCDE	AIT-H Casing Detection Enable	Yes
AHCEN	AIT-H Tool Centering Flag (in Borehole)	Eccentered
AHCSED	AIT-H Casing Shoe Estimated Depth	-50000 FT
AHMRF	AIT-H Mud Resistivity Factor	1
AHSTA	AIT-H Tool Standoff	1.125 IN
BHT	Bottom Hole Temperature (used in calculations)	136 DEGF
BS	Bit Size	7.875 IN
DFD	Drilling Fluid Density	8.60 LB/G
DORL	Depth Offset Repeat Analysis	0.0 FT
FEXP	Form Factor Exponent	2
FNUM	Form Factor Numerator	1
GCSE	Generalized Caliper Selection	HCAL
GDEV	Average Angular Deviation of Borehole from Normal	0 DEG
GGRD	Geothermal Gradient	1.000000e-02 DF/F
GRSE	Generalized Mud Resistivity Selection	AITH RESIST
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE
HMPCO	HILT RTSC Measure points correction	NO
HSCM	HILT Speed Correction Mode	TSCD_SpeedCorrect
HSTI	STI Uses HILT Acceleration	YES
MST	Mud Sample Temperature	49.00 DEGF
SHT	Surface Hole Temperature	49 DEGF
SPNV	SP Next Value	0 MV
TD	Total Depth	6524 FT

Format: AITH\_BasicLogTwo\_REP Vertical Scale: 5° per 100'

Graphics File Created: 31-OCT-1996 18:30

### OP System Version: 7C0-427

DBM

HILTB-CTS	RPCVX-680	ALLRES	RPCVX-680
HOLEV	RPCVX-680	PERT	RPCVX-680

### Speed Corrected - Depth Matched LOG

#### Input DLIS Files

DEFAULT	HILTC .003	FN:2	FIELD	31-OCT-1996 18:02	6534.0 FT	6098.5 FT
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#### Output DLIS Files

DEFAULT	HILTC .004	FN:3	FIELD	31-OCT-1996 18:30	
REDUCED	HILTC .004	FN:4	CUST	31-OCT-1996 18:30	

#### Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
High resolution Integrated Logging Tool-CTS Wellsite Calibration - Electronics Calibration Check - Thru Cal Mag. & Phase							
Master: Calibration out of date Jun 15 08:08 1996 Before: Oct 31 03:47 1996							
Thru Cal Magnitude - 0	0	0.6235	0.6241	N/A	N/A	N/A	V
Thru Cal Magnitude - 1	0	1.278	1.279	N/A	N/A	N/A	V
Thru Cal Magnitude - 2	0	0.6344	0.6345	N/A	N/A	N/A	V
Thru Cal Magnitude - 3	0	0.7182	0.7191	N/A	N/A	N/A	V
Thru Cal Magnitude - 4	0	1.342	1.345	N/A	N/A	N/A	V
Thru Cal Magnitude - 5	0	1.954	1.956	N/A	N/A	N/A	V
Thru Cal Magnitude - 6	0	1.953	1.954	N/A	N/A	N/A	V
Thru Cal Magnitude - 7	0	1.393	1.398	N/A	N/A	N/A	V
Phase - 0	0	55.81	57.18	N/A	N/A	N/A	DEG
Phase - 1	0	54.71	56.09	N/A	N/A	N/A	DEG
Phase - 2	0	50.99	52.41	N/A	N/A	N/A	DEG
Phase - 3	0	50.20	51.62	N/A	N/A	N/A	DEG
Phase - 4	0	43.97	45.44	N/A	N/A	N/A	DEG
Phase - 5	0	42.09	43.61	N/A	N/A	N/A	DEG
Phase - 6	0	42.09	43.61	N/A	N/A	N/A	DEG
Phase - 7	0	38.45	40.34	N/A	N/A	N/A	DEG

## High resolution Integrated Logging Tool-CTS Wellsite Calibration - Electronics Calibration Check - Auxilliary

Master: Calibration out of date Jun 15 08:08 1996 Before: Oct 31 03:47 1996

AIT-H SPA Plus	990.5	993.0	993.7	N/A	N/A	N/A	MV
AIT-H SPA Zero	0	-0.2287	-0.2130	N/A	N/A	N/A	MV
AIT-H Temperature Plus	0.9150	0.9198	0.9205	N/A	N/A	N/A	V
AIT-H Temperature Zero	0	-0.0002239	-0.0002027	N/A	N/A	N/A	V

## High resolution Integrated Logging Tool-CTS Wellsite Calibration - Test Loop Gain Correction

Master: Calibration out of date Jun 15 08:08 1996

Test Loop Gain Magnitude - 0	0	1.016	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 1	0	1.014	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 2	0	1.017	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 3	0	1.015	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 4	0	0.9943	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 5	0	1.007	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 6	0	1.014	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 7	0	1.026	N/A	N/A	N/A	N/A	V
Phase - 0	0	0.4351	N/A	N/A	N/A	N/A	DEG
Phase - 1	0	0.4077	N/A	N/A	N/A	N/A	DEG
Phase - 2	0	-0.07914	N/A	N/A	N/A	N/A	DEG
Phase - 3	0	-0.01529	N/A	N/A	N/A	N/A	DEG
Phase - 4	0	-0.08327	N/A	N/A	N/A	N/A	DEG
Phase - 5	0	-0.3508	N/A	N/A	N/A	N/A	DEG
Phase - 6	0	0.01955	N/A	N/A	N/A	N/A	DEG
Phase - 7	0	-0.3622	N/A	N/A	N/A	N/A	DEG

## High resolution Integrated Logging Tool-CTS Wellsite Calibration - Sonde Error Correction

Master: Calibration out of date Jun 15 08:08 1996

R Sonde Error Correction - 0	0	-117.3	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 1	0	162.8	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 2	0	107.8	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 3	0	60.03	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 4	0	24.85	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 5	0	13.28	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 6	0	9.377	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 7	0	-0.4773	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 0	0	-242.4	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 1	0	281.1	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 2	0	103.4	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 3	0	-8.335	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 4	0	-7.819	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 5	0	3.205	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 6	0	5.059	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 7	0	10.05	N/A	N/A	N/A	N/A	MM/M

## High resolution Integrated Logging Tool-CTS Wellsite Calibration - Mud Gain Correction

Master: Calibration out of date Jun 15 08:08 1996

Coarse - Mag, Real, Imag - 0	0	1.100	N/A	N/A	N/A	N/A	
Coarse - Mag, Real, Imag - 1	0	1.100	N/A	N/A	N/A	N/A	
Coarse - Mag, Real, Imag - 2	0	1.100	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 0	0	1.098	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 1	0	1.099	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 2	0	1.099	N/A	N/A	N/A	N/A	

## High resolution Integrated Logging Tool-CTS Wellsite Calibration - Stab Measurement Summary

Before: Oct 29 18:21 1996

BS Window Ratio	0.9774	N/A	0.9862	N/A	N/A	N/A	
BS Window Sum	16100	N/A	16100	N/A	N/A	N/A	CPS
SS Window Ratio	0.4734	N/A	0.4747	N/A	N/A	N/A	
SS Window Sum	11670	N/A	11650	N/A	N/A	N/A	CPS
LS Window Ratio	0.2997	N/A	0.2980	N/A	N/A	N/A	
LS Window Sum	1610	N/A	1599	N/A	N/A	N/A	CPS

## High resolution Integrated Logging Tool-CTS Wellsite Calibration - Photo-multiplier High Voltages Calibrations

Before: Oct 29 18:21 1996

BS PM High Voltage (Command)	1535	N/A	1503	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1646	N/A	1649	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1879	N/A	1879	N/A	N/A	N/A	V

## High resolution Integrated Logging Tool-CTS Wellsite Calibration - Crystal Quality Resolutions Calibration

Before: Oct 29 18:21 1996

BS Crystal Resolution	12.73	N/A	12.54	N/A	N/A	N/A	%
SS Crystal Resolution	9.561	N/A	9.566	N/A	N/A	N/A	%
LS Crystal Resolution	9.822	N/A	10.09	N/A	N/A	N/A	%

## High resolution Integrated Logging Tool-CTS Wellsite Calibration - MCFL Calibration

Before: Oct 29 18:22 1996

Raw B0 Resistivity	3875	N/A	3870	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3855	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3863	N/A	N/A	N/A	OHMM

## High resolution Integrated Logging Tool-CTS Wellsite Calibration - HILT Caliper Calibration

Before: Oct 29 18:18 1996

HILT Caliper Zero Measurement	8.000	N/A	7.866	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	12.11	N/A	N/A	N/A	IN

## High resolution Integrated Logging Tool-CTS Wellsite Calibration - Detector Calibration

Before: Oct 29 18:29 1996

Gamma Ray Background	30.00	N/A	37.37	N/A	N/A	N/A	GAPI
Gamma Ray (Jig - Bkg)	178.6	N/A	178.6	N/A	N/A	16.24	GAPI
Gamma Ray (Calibrated)	165.0	N/A	165.0	N/A	N/A	15.00	GAPI

## High resolution Integrated Logging Tool-CTS Wellsite Calibration - Zero Measurement

Master: Aug 2 02:04 1996 Before: Oct 29 18:20 1996

CNTC Background	25.80	25.80	26.17	N/A	N/A	3.870	CPS
CFTC Background	26.10	26.10	24.00	N/A	N/A	3.915	CPS

## High resolution Integrated Logging Tool-CTS Wellsite Calibration - Accelerometer Calibration

Before: Oct 30 02:08 1996

Z-Axis Acceleration	32.19	N/A	32.12	N/A	N/A	N/A	F/S2
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The CNT Master Calibration Was Done With The Following Parameters :

NCT-B Water Temperature 83.0 DEGF.  
Thermal Housing Size 3.375 IN.

## High resolution Integrated Logging Tool-CTS / Equipment Identification

## Primary Equipment:

Array Induction Tool - H	AIT - H
Array Induction Sonde	AHIS - BA
HILT high-Resolution Mechanical Sonde	HRMS - B
HILT Rxo Gamma-ray Device	HRGD -
HILT Nuclear Back-Scatter Detector	HILT -
HILT Nuclear Short-Spacing Detector	HILT -
HILT Nuclear Long-Spacing Detector	HILT -
Micro Cylindrically Focused Log Device	MCFL -

## Auxiliary Equipment:

## High resolution Integrated Logging Tool-CTS Wellsite Calibration

## Electronics Calibration Check - Thru Cal Mag. &amp; Phase

Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG		Nominal
						Phase	DEG	
0	Master	0.6235		0.6050	55.81			71.00
	Before	0.6241			57.18			
1	Master	1.278		1.270	54.71			70.00
	Before	1.279			56.09			
2	Master	0.6344		0.6230	50.99			66.00
	Before	0.6345			52.41			
3	Master	0.7182		0.7040	50.20			65.00
	Before	0.7191			51.62			
4	Master	1.342		1.337	43.97			59.00
	Before	1.345			45.44			
5	Master	1.954		1.955	42.09			57.00
	Before	1.956			43.61			
6	Master	1.953		1.955	42.09			57.00
	Before	1.954			43.61			
7	Master	1.393		1.415	36.45			53.00
	Before	1.398			40.34			
		60.00 % (Minimum)	140.0 % (Maximum)		Nom -60.00 (Minimum)	Nom +60.00 (Maximum)		

High resolution Integrated Logging Tool-CTS Wellsite Calibration						
Electronics Calibration Check - Auxiliary						
Phase	AIT-H SPA Plus MV	Value	Phase	AIT-H SPA Zero MV	Value	
Master		993.0	Master		-0.2267	
Before		993.7	Before		-0.2130	
	941.0 (Minimum)	990.5 (Nominal)	1040 (Maximum)	-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
Phase	AIT-H Temperature Plus V	Value	Phase	AIT-H Temperature Zero V	Value	
Master		0.9198	Master		-0.0002239	
Before		0.9205	Before		-0.0002027	
	0.8700 (Minimum)	0.9150 (Nominal)	0.9600 (Maximum)	-0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)

Master: Calibration out of date Jun 15 08:08 1996

Before: Oct 31 03:47 1996

High resolution Integrated Logging Tool-CTS Wellsite Calibration						
Test Loop Gain Correction						
Idx	Value	Test Loop Gain Magnitude V	Value	Phase DEG		
0	1.016		0.4351			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
1	1.014		0.4877			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
2	1.017		-0.07914			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
3	1.015		-0.01529			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
4	0.9943		-0.08327			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
5	1.007		-0.3508			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
6	1.014		0.01955			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
7	1.026		-0.3622			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)

Master: Calibration out of date Jun 15 08:08 1996

High resolution Integrated Logging Tool-CTS Wellsite Calibration						
Sonde Error Correction						
Idx	Value	R Sonde Error Correction MM/M	Value	X Sonde Error Correction MM/M		
0	-117.3		-242.4			
	-231.0 (Minimum)	-56.00 (Nominal)	119.0 (Maximum)	-2250 (Minimum)	0 (Nominal)	2250 (Maximum)
1	162.8		281.1			
	114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)	-625.0 (Minimum)	0 (Nominal)	625.0 (Maximum)
2	107.8		103.4			
	66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)	-350.0 (Minimum)	0 (Nominal)	350.0 (Maximum)
3	60.03		-8.335			
	39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)	-250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)
4	24.85		-7.819			
	15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)	-63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)
5	13.28		3.205			
	4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)	-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)

	(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)
6	9.377			5.059		
	5.000	10.00	15.00	-30.00	0	30.00
	(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)
7	-0.4773			15.03		
	-5.000	0	5.000	-30.00	0	30.00
	(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)

Master: Calibration out of date Jun 15 08:08 1996

High resolution Integrated Logging Tool-CTS Wellsite Calibration						
Mud Gain Correction						
Idx	Value	Coarse - Mag, Real, Imag		Value	Fine - Mag, Real, Imag	
0	1.100			1.098		
	0.6000	1.000	1.400	0.6000	1.000	1.400
	(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)
1	1.100			1.099		
	0.6000	1.000	1.400	0.6000	1.000	1.400
	(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)
2	1.100			1.099		
	0.6000	1.000	1.400	0.6000	1.000	1.400
	(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)

Master: Calibration out of date Jun 15 08:08 1996

High resolution Integrated Logging Tool-CTS Wellsite Calibration									
Stab Measurement Summary									
Phase	BS Window Ratio	Value	Phase	SS Window Ratio	Value	Phase	LS Window Ratio	Value	
Before		0.9862	Before		0.4747	Before		0.2980	
	0.9285	0.9774	1.026	0.4497	0.4734	0.4971	0.2848	0.2997	0.3147
	(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)
Phase	BS Window Sum CPS	Value	Phase	SS Window Sum CPS	Value	Phase	LS Window Sum CPS	Value	
Before		16100	Before		11650	Before		1599	
	15290	16100	16900	11080	11670	12260	1529	1610	1690
	(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)

Before: Oct 29 18:21 1996

High resolution Integrated Logging Tool-CTS Wellsite Calibration									
Photo-multiplier High Voltages Calibrations									
Phase	BS PM High Voltage (Command) V	Value	Phase	SS PM High Voltage (Command) V	Value	Phase	LS PM High Voltage (Command) V	Value	
Before		1503	Before		1649	Before		1879	
	1435	1535	1635	1546	1646	1746	1779	1879	1979
	(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)

Before: Oct 29 18:21 1996

High resolution Integrated Logging Tool-CTS Wellsite Calibration									
Crystal Quality Resolutions Calibration									
Phase	BS Crystal Resolution %	Value	Phase	SS Crystal Resolution %	Value	Phase	LS Crystal Resolution %	Value	
Before		12.54	Before		9.566	Before		10.09	
	11.73	12.73	13.73	8.561	9.561	10.56	8.822	9.822	10.82
	(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)

Before: Oct 29 18:21 1996

High resolution Integrated Logging Tool-CTS Wellsite Calibration									
MCFL Calibration									
Phase	Raw B0 Resistivity OHMM	Value	Phase	Raw B1 Resistivity OHMM	Value	Phase	Raw B2 Resistivity OHMM	Value	
Before		3870	Before		3855	Before		3863	
	3565	3875	4185	3524	3830	4136	3524	3830	4136
	(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)

Before: Oct 29 18:22 1996

High resolution Integrated Logging Tool-CTS Wellsite Calibration						
HILT Caliper Calibration						
Phase	HILT Caliper Zero Measurement IN	Value	Phase	HILT Caliper Plus Measurement IN	Value	
Before		7.866	Before		12.11	
	6.000	8.000	10.00	9.000	12.00	15.00
	(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)

Before: Oct 29 18:18 1996

## High resolution Integrated Logging Tool-CTS Wellsite Calibration

## Detector Calibration

Phase	Gamma Ray Background GAPI	Value	Phase	Gamma Ray (Jig - Bkg) GAPI	Value	Phase	Gamma Ray (Calibrated) G-API	Value
Before		37.37	Before		178.6	Before		165.0
0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)	162.4 (Minimum)	178.6 (Nominal)	194.9 (Maximum)	150.0 (Minimum)	165.0 (Nominal)	180.0 (Maximum)

Before: Oct 29 18:29 1996

## High resolution Integrated Logging Tool-CTS Wellsite Calibration

## Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		25.00	Master		25.10
Before		26.17	Before		24.00
5.000 (Minimum)	25.80 (Nominal)	40.00 (Maximum)	5.000 (Minimum)	26.10 (Nominal)	40.00 (Maximum)

Master: Aug 20 02:04 1996

Before: Oct 29 18:20 1996

High resolution Integrated Logging Tool-CTS  
Wellsite Calibration

## Accelerometer Calibration

Phase	Z-Axis Acceleration F/S2	Value
Before		3212
31.53 (Minimum)	3239 (Nominal)	3254 (Maximum)

Before: Oct 30 02:08 1996

COMPANY	PETROGLYPH OPERATING COMPANY INC	BOTTOM LOG INTERVAL	6514 F
WELL	UTE TRIBAL #03-04	SCHLUMBERGER DEPTH	6522 F
FIELD	ANTELOPE CREEK	DEPTH DRILLER	6524 F
COUNTY	DUCHESNE	KELLY BUSHING	5901.9 F
STATE	UTAH	DRILL FLOOR	5900.9 F
		GROUND LEVEL	5891.9 F

Schlumberger

**ARRAY INDUCTION**  
**with Linear Correlation**  
**GAMMA RAY**

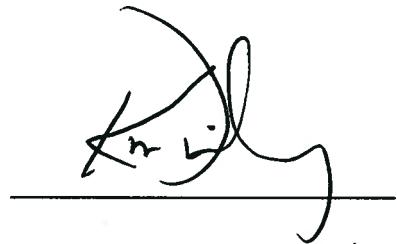
**ATTACHMENT NO. 9**

**LIST OF OWNERS AND AFFIDAVIT NOTIFICATION**

## AFFIDAVIT OF MAILING

I, Kevin Dickey, Vice President, Operations, Petroglyph Energy, being first duly sworn, depose and state as follows: On July 24<sup>th</sup>, 2015, I caused to be mailed by certified mail, postage prepaid, return receipt requested, a copy of the Application to convert 1 well that appears on the attached sheet to water injection for enhanced recovery. It was sent to all parties who have an interest within ¼ mile radius from this well. The attached list contains the names of all parties who were notified.

Dated on this 24<sup>th</sup> day of July, 2015



---

Kevin Dickey

Vice President, Operations

Petroglyph Energy

The forgoing affidavit was subscribed and sworn to before me by Kevin Dickey.

This 24 day of July, 2015.



Notary Public



July 24<sup>th</sup>, 2015

**Mineral, Surface, and Working Interest Owners**

To Whom It May Concern,

On July 24<sup>th</sup>, 2015, Petroglyph Energy Inc. submitted to the Environmental Protection Agency an application requesting approval to convert 1 well to a water injection well in an enhanced recovery program. The well which was submitted is located in Antelope Creek Field which is operated under a Cooperative Plan of Development between the Ute Tribe and Petroglyph Energy.

**Owners at Well's Location**

Mineral: Ute Tribe

Operator: Petroglyph

Surface: Ute Tribe

Working Interest: 100% Petroglyph

**Owners within Well's ¼ mile radius**

No others

No others

Dennis Moon and Kenneth Moon

Anyone who would be directly and adversely affected by the authorization of the underground disposal into the Upper Green River formation may file a written request for a public hearing before the EPA. Logs and additional information on the subject wells are on file with the EPA, Groundwater Program, Mail Code 8P-W-UIC, 1595 Wynkoop St, Denver, Colorado 80202-1129.

Please contact Kevin Dickey at 208-685-7600 if you have any questions.

Sincerely,



Kevin Dickey

Vice President Operations, Petroglyph Energy

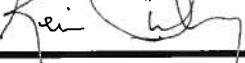
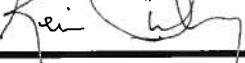
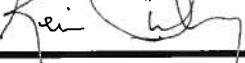
Enclosure

**PETROGLYPH OPERATING COMPANY, INC.**

**ANTELOPE CREEK FIELD**

**WELLS TO BE CONVERTED TO INJECTION**

<b>Well Name and Number</b>	<b>Footages</b>	<b>Section, Township, and Range</b>
Ute Tribal 03-04	360' FNL & 460' FWL	3, T5S-R3W

<p style="text-align: center;"><b>United States Environmental Protection Agency</b>  <b>Underground Injection Control</b>  <b>Permit Application</b>  <i>(Collected under the authority of the Safe Drinking Water Act, Sections 1421, 1422, 40 CFR 144)</i></p>																																																							
<b>Read Attached Instructions Before Starting For Official Use Only</b>																																																							
Application approved mo day year			Date received mo day year			Permit Number			Well ID		FINDS Number																																												
<b>II. Owner Name and Address</b> <table border="1" style="width: 100%;"> <tr> <td colspan="2">Owner Name Petroglyph Energy, Inc.</td> <td colspan="2">Owner Name Petroglyph Energy, Inc.</td> </tr> <tr> <td colspan="2">Street Address 960 Broadway Ave. Suite 500 PO Box 70019</td> <td colspan="2">Phone Number (208) 685-7600</td> </tr> <tr> <td colspan="2">City Boise</td> <td>State ID</td> <td>ZIP CODE 83707</td> </tr> <tr> <td colspan="2"></td> <td colspan="2"></td> </tr> </table>												Owner Name Petroglyph Energy, Inc.		Owner Name Petroglyph Energy, Inc.		Street Address 960 Broadway Ave. Suite 500 PO Box 70019		Phone Number (208) 685-7600		City Boise		State ID	ZIP CODE 83707																																
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<b>IV. Commercial Facility</b> <table border="1" style="width: 100%;"> <tr> <td><input type="checkbox"/> Yes</td> <td><input checked="" type="checkbox"/> Private</td> </tr> <tr> <td><input checked="" type="checkbox"/> No</td> <td><input type="checkbox"/> Federal</td> </tr> <tr> <td></td> <td><input type="checkbox"/> Other</td> </tr> </table>			<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> Private	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Federal		<input type="checkbox"/> Other	<b>V. Ownership</b> <table border="1" style="width: 100%;"> <tr> <td><input type="checkbox"/> Owner</td> </tr> <tr> <td><input checked="" type="checkbox"/> Operator</td> </tr> </table>			<input type="checkbox"/> Owner	<input checked="" type="checkbox"/> Operator	<b>VI. Legal Contact</b> <table border="1" style="width: 100%;"> <tr> <td></td> </tr> </table>				<b>VII. SIC Codes</b> <table border="1" style="width: 100%;"> <tr> <td></td> </tr> </table>																																					
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	<input type="checkbox"/> Other																																																						
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<input checked="" type="checkbox"/> Operator																																																							
<b>VIII. Well Status (Mark "x")</b> <table border="1" style="width: 100%;"> <tr> <td><input checked="" type="checkbox"/> A</td> <td>Date Started mo day year</td> <td><input checked="" type="checkbox"/> B. Modification/Conversion</td> <td><input type="checkbox"/> C. Proposed</td> </tr> <tr> <td>Operating</td> <td></td> <td></td> <td></td> </tr> </table>												<input checked="" type="checkbox"/> A	Date Started mo day year	<input checked="" type="checkbox"/> B. Modification/Conversion	<input type="checkbox"/> C. Proposed	Operating																																							
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<b>IX. Type of Permit Requested (Mark "x" and specify if required)</b> <table border="1" style="width: 100%;"> <tr> <td><input type="checkbox"/> A. Individual</td> <td><input checked="" type="checkbox"/> B. Area</td> <td>Number of Existing Wells 111</td> <td>Number of Proposed Wells 1</td> <td>Name(s) of field(s) or project(s) Antelope Creek Ute Tribal 03-04</td> </tr> </table>												<input type="checkbox"/> A. Individual	<input checked="" type="checkbox"/> B. Area	Number of Existing Wells 111	Number of Proposed Wells 1	Name(s) of field(s) or project(s) Antelope Creek Ute Tribal 03-04																																							
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<b>X. Class and Type of Well (see reverse)</b> <table border="1" style="width: 100%;"> <tr> <td>A. Class(es) (enter code(s)) II</td> <td>B. Type(s) (enter code(s)) R</td> <td>C. If class is "other" or type is code 'x,' explain  </td> <td>D. Number of wells per type (if area permit) 1 well, type R</td> </tr> </table>												A. Class(es) (enter code(s)) II	B. Type(s) (enter code(s)) R	C. If class is "other" or type is code 'x,' explain  	D. Number of wells per type (if area permit) 1 well, type R																																								
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<b>XI. Location of Well(s) or Approximate Center of Field or Project</b> <table border="1" style="width: 100%;"> <tr> <td colspan="3">Latitude</td> <td colspan="3">Longitude</td> <td colspan="3">Township and Range</td> <td></td> <td></td> <td></td> <td></td> <td><input checked="" type="checkbox"/> Yes</td> </tr> <tr> <td>Deg</td> <td>Min</td> <td>Sec</td> <td>Deg</td> <td>Min</td> <td>Sec</td> <td>Sec</td> <td>Twp</td> <td>Range</td> <td>1/4 Sec</td> <td>Feet From</td> <td>Line</td> <td>Feet From</td> <td>Line</td> <td><input type="checkbox"/> No</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>3</td> <td>5S</td> <td>3W</td> <td>NW</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>												Latitude			Longitude			Township and Range							<input checked="" type="checkbox"/> Yes	Deg	Min	Sec	Deg	Min	Sec	Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line	<input type="checkbox"/> No							3	5S	3W	NW					
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<input checked="" type="checkbox"/>																																																							
<b>XIII. Attachments</b> <i>(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)</i> For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.																																																							
<b>XIV. Certification</b> <p>I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)</p> <table border="1" style="width: 100%;"> <tr> <td>A. Name and Title (Type or Print) Kevin Dickey, Vice President, Operations</td> <td>B. Phone No. (Area Code and No.) (208) 685-7600</td> </tr> <tr> <td>C. Signature </td> <td>D. Date Signed 07/27/2015</td> </tr> </table>												A. Name and Title (Type or Print) Kevin Dickey, Vice President, Operations	B. Phone No. (Area Code and No.) (208) 685-7600	C. Signature 	D. Date Signed 07/27/2015																																								
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C. Signature 	D. Date Signed 07/27/2015																																																						

**ATTACHMENT NO. 10**

**WELL BORE DIAGRAMS FOR THE UIC WELL**

## Ute Tribal 03-04 Well History

### Well History:

Spud Well: 10/25/1996  
 Completed: 12/1/1996  
 First Production: 12/12/1996

### Tops (KB):

#### BMSW\* Found at 902'

Green River 1476'

**A Marker 4186'**

X Marker 4679'

Douglas Creek 4824'

B Limestone 5216'

Castle Peak 5781'

**Basal Carbonate 6194'**

### Perf History:

11/23/1996

D3	5298' to 5304'
D7	5520' to 5526'
D7	5560' to 5566'
D7	5606' to 5612'
E01.1	5846' to 5850'

5/24/2012

B4	4282' to 4299'
C05.2	4917' to 4920'
C08.1	5082' to 5084'
C09.1	5152' to 5154'
C09.2	5173' to 5175'
D3	5295' to 5298'
D3	5304' to 5308'
D7	5601' to 5606'
D7	5612' to 5616'

Petroglyph Operating Co., Inc.

Ute Tribal #03-04

(360' FNL & 460' FWL)

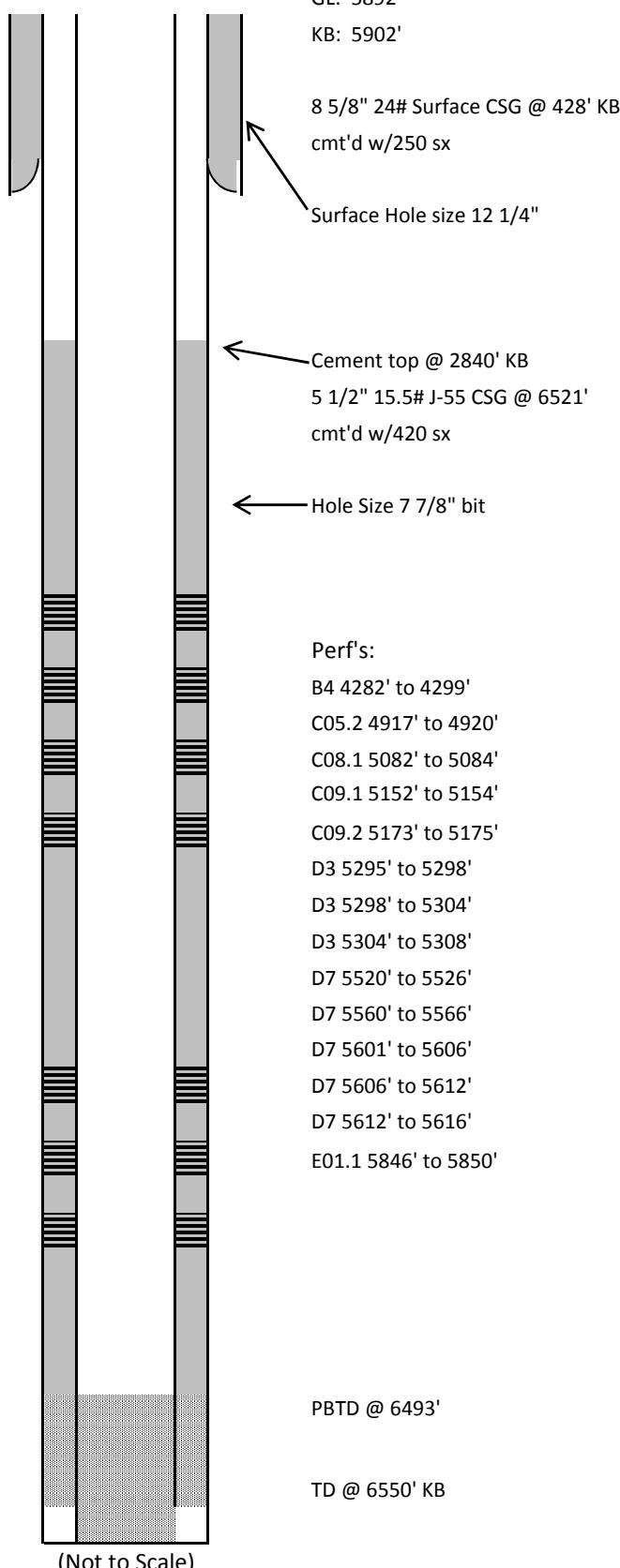
Lot 4 Section 3, 5S-3W

Antelope Creek Field

Duchesne Co. Utah

API#: 43013317360000

\*Plate 1 Utah Geological Survey Special Study 144.  
 (2012). *BMSW Elevation Contour Map, Uinta Basin, Utah, Plate 1* [map]. (CA 1:200,000)



## Ute Tribal 03-04 Injection

### Well History:

Spud Well: 10/25/1996  
 Completed: 12/1/1996  
 First Production: 12/12/1996

### Tops (KB)

**BMSW\* Found at 902'**

Green River 1476'

**A Marker 4186'**

X Marker 4679'

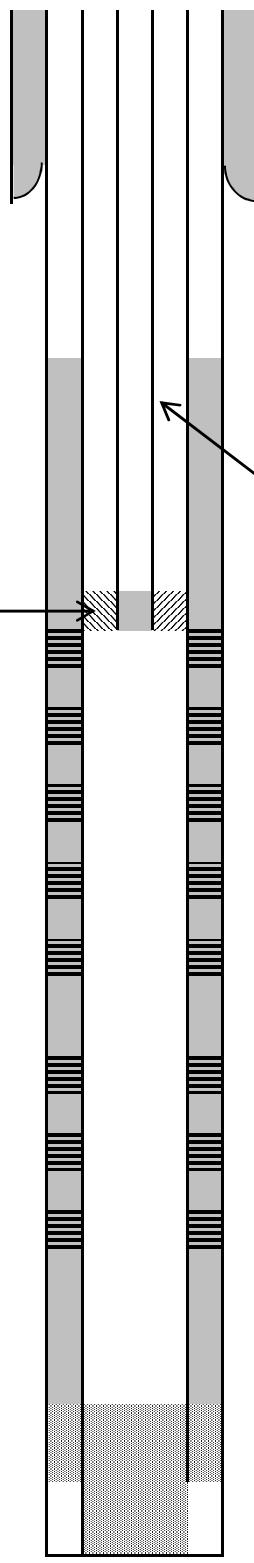
Douglas Creek 4824'

B Limestone 5216'

Castle Peak 5781'

**Basal Carbonate 6194'**

Injection Packer @ 4192'



GL: 5892'

KB: 5902'

8 5/8" 24# Surface CSG @ 428' KB  
 cmt'd w/250 sx

Surface Hole size 12 1/4"

Hole Size 7 7/8" bit

Cement top @ 2840' KB  
 5 1/2" 15.5# J-55 CSG @ 6521'  
 cmt'd w/420 sx

Tubing 2 7/8" 6.5# J55

Perf's:

B4 4282' to 4299'

C05.2 4917' to 4920'

C08.1 5082' to 5084'

C09.1 5152' to 5154'

C09.2 5173' to 5175'

D3 5295' to 5298'

D3 5298' to 5304'

D3 5304' to 5308'

D7 5520' to 5526'

D7 5560' to 5566'

D7 5601' to 5606'

D7 5606' to 5612'

D7 5612' to 5616'

Add E01.1 5840' to 5844'

E01.1 5846' to 5850'

Add E01.1 5850' to 5855'

PBTD @ 6493'

TD @ 6550'

Petroglyph Operating Co., Inc.

Ute Tribal #03-04

(360' FNL & 460' FWL)

Lot 4 Section 3, 5S-3W

Antelope Creek Field

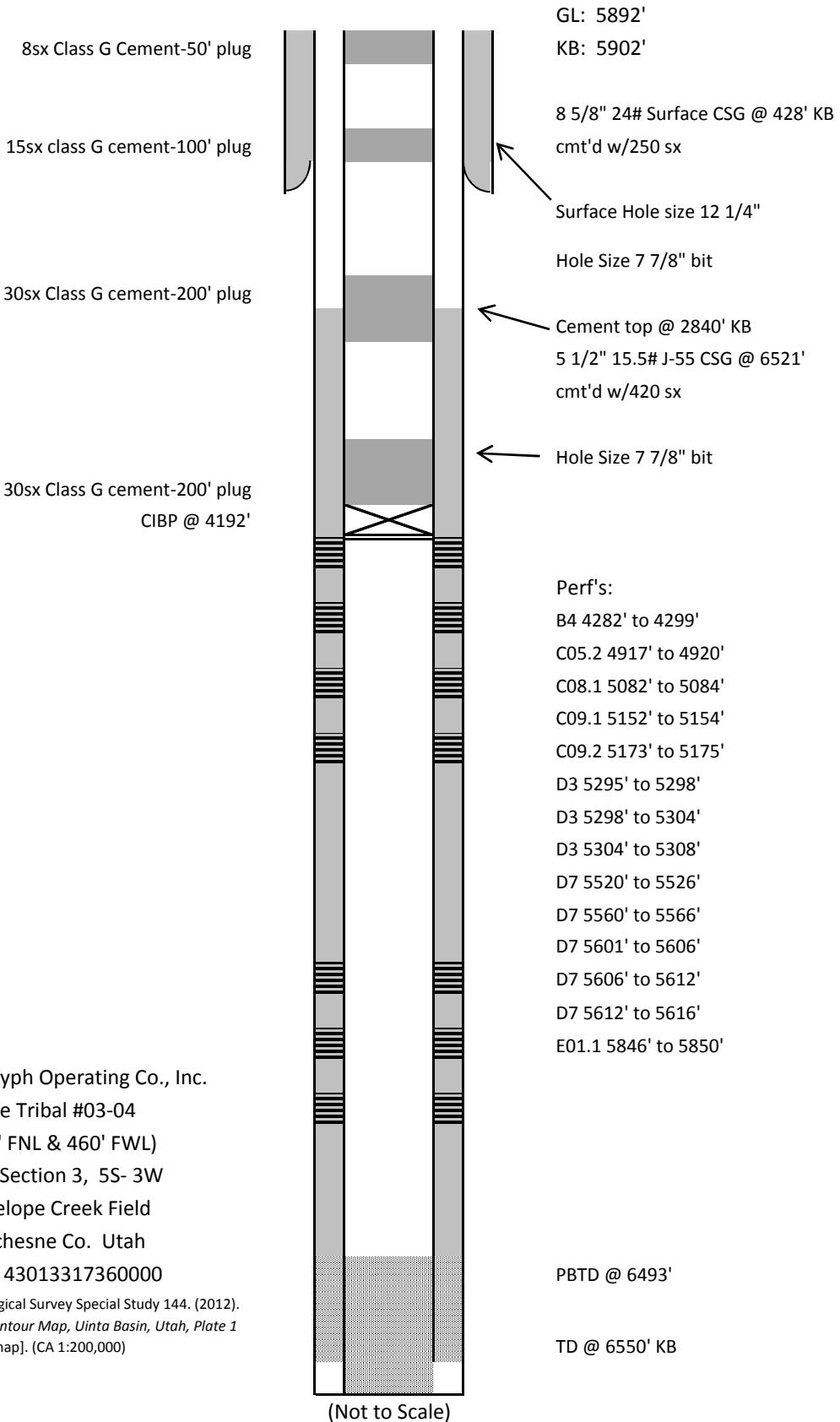
Duchesne Co. Utah

API#: 43013317360000

\*Plate 1 Utah Geological Survey Special Study 144. (2012).  
*BMSW Elevation Contour Map, Uinta Basin, Utah, Plate 1*  
 [map]. (CA 1:200,000)

(Not to Scale)

## Ute Tribal 03-04 Plug and Abandonment



Petroglyph Operating Co., Inc.  
Ute Tribal #03-04  
(360' FNL & 460' FWL)  
Lot 4 Section 3, 5S- 3W  
Antelope Creek Field  
Duchesne Co. Utah  
API#: 43013317360000

\*Plate 1 Utah Geological Survey Special Study 144. (2012).  
BMSW Elevation Contour Map, Uinta Basin, Utah, Plate 1  
[map]. (CA 1:200,000)

**ATTACHMENT NO. 11**

**P&A PROCEDURE**

## **Plug and Abandonment Procedure**

**Ute Tribal 03-04**

**43-013-31736**

1. Obtain authorization from regulatory agencies for P&A procedures.
2. Set deadman. Rig up pulling unit. Rig down wellhead. Install BOP. Release packer. Trip out of hole with tubing and packer.
3. RIH Set CIBP @ 4192'.
4. Trip in hole with tubing. Establish pump rate, spot 30sxs Class G cement on top of CIBP. This will be a 200' plug.
5. Raise the tubing to 2840' and set balanced 200' cement plug using 30sxs of Class G cement.
6. Raise the tubing to 428' and set balanced 100' cement plug using 15sxs of Class G cement.
7. Set balanced 50' cement plug (8 sxs of Class G cement) from 50' to surface.
8. Cut off wellhead. Install plate and identification P&A post marker. Weld to casing.
9. File reports with the agencies and reclaim surface locations.

**ATTACHMENT NO. 12**

**MIT PROCEDURE**

## **Mechanical Integrity Test Procedure**

**Ute Tribal 03-04**

**43-013-31736**

Integrity testing can be accomplished by pressuring up the annulus between the casing and the tubing. The pressure and duration of the test will be as required by the EPA.

### **Test Procedure Details:**

1. Two weeks prior, notify EPA of pending work. Shut well in.
2. Record fluid level with echometer.
3. MIRU Service Unit.
4. POOH laying down rods and pump.
5. ND Wellhead. NU BOPs. POOH laying down 2 7/8" tubing.
6. RU Wireline. Add new perfs: E01.1 5840' to 5844' and 5850' to 5855' .
7. RD Wireline.
8. PU plug and packer and new tubing. RIH and breakdown perfs.
9. POOH. RIH with injection packer to 4192'.
10. Reverse circulate in packer fluid.
11. Set packer and ND BOPs and NU wellhead.
12. Pressure test casing-tubing annulus to 1500psi for 15 minutes.
13. RDMO.
14. Notify EPA of test, wait for approval.
15. Return to injection.

**ATTACHMENT NO. 13**  
**SURETY BOND LETTER**

**SURETY BOND STATEMENT**

July 27, 2015

Petroglyph currently operates 111 injection wells in Antelope Creek Field under EPA UIC Area Permit UT2736-00000. The existing wells are covered by UIC Bond No. LPM 4138351.

Prior to final permit approval, Petroglyph will add a rider to the existing bond to include this well along with the other wells being submitted to EPA at this time.

Kevin Dickey

V.P., Operations

Petroglyph Energy, Inc.

**PETROGLYPH OPERATING COMPANY, INC.**